THE MARVEL CYCLOPEDIA

LIBRARY OF CONGRESS.

Chap. AG 103 Copyright No.

Shelf S375

UNITED STATES OF AMERICA.

EDITION FOR 1893-94

THE MARVEL CYCLOPEDIA

A Condensed Library of Useful Knowledge

EDITED BY K. L. ARMSTRONG

"Which—if you but open—
You will be unwilling,
For many a shilling,
To part with the profit
Which you shall have of it."

C. ROPP & SONS, PUBLISHERS
CHICAGO

"The era is fast approaching when no writer will be read by the majority, except those who can effect for bales of manuscript what the hydrostatic screw performs for bales of cotton—condense into a period what before occupied a page."—Cotter.

AG 105
.S375

LC Control Number

tmp96 032531

THE LIBRARY OF CONGRESS
WASHINGTON

COPYRIGHT, 1889, BY FRANCIS J. SCHULTE.
COPYRIGHT, 1893, BY SCHULTE PUBLISHING CO.

This rule to all when I am dead:
Be sure you're right, then go ahead.
—DAVY CROCKETT.

GEMS OF KNOWLEDGE.

Handy Facts to Settle Many Arguments.

London plague in 1665.
Telephone invented, 1861.
There are 2,750 languages.
Two persons die every second.
Sound moves 743 miles per hour.
Chinese invented paper, 170 B.C.
A square mile contains 640 acres.
A barrel of pork weighs 200 pounds.
Hawks can fly 150 miles in one hour.
Watches were first constructed in 1476.
Chinese in United States in 1880, 105,613.
Rome was founded by Romulus, 752 B.C.
Gold was discovered in California in 1848.
Phonograph invented by T. A. Edison, 1877.
The first balloon ascended from Lyons, France, 1783.
The first fire insurance office in America, Boston, 1724.
Jet is found along the coast of Yorkshire, Eng., near Whitby.
Napoleon I. crowned emperor, 1804; died at St. Helena, 1820.
Electric light invented by Lodyguin and Kossloff, at London, 1874.
Harvard is the oldest college in the United States; established in 1638.
War declared with Great Britain, June 19, 1812; peace, Feb. 18, 1815.
Until 1776 cotton spinning was performed by the hand spinning-wheel.
Measure 209 feet on each side and you will have a square acre within an inch.
Postage stamps first came into use in England in the year 1840; in the United States, in 1847.
The highest range of mountains are the Himalayas, the mean elevation being from 16,000 to 18,000 feet.
The largest inland sea is the Caspian, between Europe and Asia, being 700 miles long and 270 miles wide.
The term "Almighty Dollar" originated with Washington Irving, as a satire on the American love for gain.

Envelopes were first used in 1839.
Telescopes were invented in 1590.
Iron horseshoes were made in 481.
A barrel of flour weighs 196 pounds.
A hand (horse measure) is four inches.
A rifle ball moves 1,000 miles per hour.
First steamer crossed the Atlantic, 1819.
Assassination of Lincoln, April 14, 1865.
German empire re-established, Jan. 18, 1871.
Storm clouds move thirty-six miles an hour.
First subscription library, Philadelphia, 1731.
Dark Ages, from the 6th to the 14th century.
The Latin tongue became obsolete about 580.
The great London fire occurred Sept. 26, 1666.
The value of a ton of pure gold is $602,799.21.
Ether was first used for surgical purposes in 1844.
Ignatius Loyola founded the order of Jesuits, 1541.
First authentic use of organs, 755; in England, 951.
The first newspaper advertisement appeared in 1652.
Cork is the bark taken from a species of the oak tree.
Benjamin Franklin used the first lightning rods, 1752.
Glass windows (colored) were used in the 8th century.
Authentic history of China commenced 3,000 years B.C.
Introduction of homœopathy into the United States, 1825.
Spectacles were invented by an Italian in the 13th century.
Medicine was introduced into Rome from Greece, 200 B.C.
First electric telegraph, Paddington to Brayton, Eng.. 1835.
The Chaldeans were the first people who worked in metals.
First life insurance, in London, 1772; in America, Phila., 1812.
Egyptian pottery is the oldest known; dates from 2,000 B.C.
Julius Cæsar invaded Britain, 55 B.C.; assassinated, 44 B.C.
Soap was first manufactured in England in the 16th century.
The largest free territorial government is the United States.
First photographs produced in England, 1802; perfected, 1841.
First marine insurance, A. D. 533; England, 1598; America, 1721.
Professor Oersted, Copenhagen, discovered electro-magnetism, in 1819.
First American express, New York to Boston—W. F. Harnden.
Glass windows were first introduced into England in the 8th century.
Chicago is little more than fifty years old, and is the eighteenth city of the world.
Glass was made in Egypt, 3,000 B.C.; earliest date of transparent glass, 719 B.C.
First public schools in America were established in the New England States about 1642.

First Atlantic cable operated, 1858.
A barrel of rice weighs 600 pounds.
The first steel pen was made in 1830.
Light moves 187,000 miles per second.
Slow rivers flow seven miles per hour.
The first lucifer match was made in 1829.
A storm moves thirty-six miles per hour.
Battles of Bunker Hill and Lexington, 1775.
The largest island in the world is Australia.
First musical notes used, 1338; printed, 1502.
Kerosene was first used for illuminating in 1826.
National banks first established in United States, 1816.
Slavery in the United States was begun at Jamestown in 1619
First postoffice established, between Vienna and Brussels 1516.
The Alexandrian Library contained 400,000 valuable books 47 B.C.
Moscow, Russia, has the largest bell in the world, 432,000 pounds.
The highest denomination of United States legal tender notes is $10,000.
The electric eel is only found in the northern rivers of South America.
Columbus discovered America, Oct. 12, 1492; the Northmen A. D. 985.
The first theater in the United States was at Williamsburg Va., 1752.
Congress declared war with Mexico, May 13, 1846; closed Feb. 2, 1848.
The first complete sewing machine was patented by Elias Howe, Jr., in 1846.
London is the largest city in the world, containing a population of 4,764,312 persons.
First cotton raised in the United States was in Virginia, in 1621; first exported, 1747.
The largest university is Oxford, in England. It consists of twenty-one colleges and five halls.
First sugar-cane cultivated in the United States, near New Orleans, 1751; first sugar-mill, 1758.
First telegraph in operation in America was between Washington and Baltimore, May 27, 1844.
The first illumination with gas was in Cornwall, Eng., 1792; in the United States, at Boston, 1822.
Printing was known in China in the 6th century; introduced into England about 1474; America, 1536.
The great wall of China, built 200 B.C., is 1,250 miles in length, 20 feet high, and 25 feet thick at the base.
Glass mirrors first made by Venetians in the 13th century. Polished metal was used before that time.
Meerschaum means "froth of the sea." It is white and soft when dug from the earth, but soon hardens.

America was discovered in 1492.
A firkin of butter weighs 56 pounds.
A span is ten and seven-eighths inches.
Pianoforte invented in Italy about 1710.
The value of a ton of silver is $37,704.84.
First watches made in Nuremberg, 1476.
A hurricane moves eighty miles per hour.
Modern needles first came into use in 1545.
Electricity moves 288,000 miles per second.
French and Indian War in America, 1754.
The first horse railroad was built in 1826–7.
The average human life is thirty-three years.
Coaches were first used in England in 1569.
French Revolution, 1789; Reign of Terror, 1793.
$1,000,000 gold coin weigh 3,685.8 lbs. avoirdupois.
Mormons arrived at Salt Lake Valley, Utah, July 24, 1847.
Experiments in electric lighting, by Thomas A. Edison, 1878–80.
Daguerre and Nieper invented the process of daguerreotype, 839.
The largest cavern in the world is the Mammoth Cave, Kentucky.
First American library founded at Harvard College, Cambridge, 1638.
The first iron ore discovered in this country was found in Virginia in 1715.
"Bravest of the Brave" was the title given to Marshal Ney at Friedland, 1807.
The first steam engine on this continent was brought from England in 1753.
The most extensive park is Deer Park in Denmark. It contains 4,200 acres.
Books in their present form were invented by Attalus, king of Pergamus, in 887.
Robert Raikes established the first Sunday-school, at Gloucester, Eng., 1781.
Albert Durer gave the world a prophecy of future wood engraving in 1527.
St. Augustine, oldest city in the United States, founded by the Spaniards, 1565.
Jamestown, Va., founded, 1607; first permanent English settlement in America.
The first volunteer fire company in the United States was at Philadelphia, 1736.
Oberlin College, Ohio, was the first in the United States that admitted female students.
The first knives were used in England, and the first wheeled carriages in France in 1559.
The largest park in the United States is Fairmount, at Philadelphia, and contains 2,740 acres.

The highest natural bridge in the world is at Rockbridge, Virginia, being 200 feet high to the bottom of the arch.

The largest circulation of paper money is that of the United States, being 700 millions, while Russia has 670 millions.

The largest insurance company in the world is the Mutual Life of New York City, having cash assets of $108,000,000.

The largest empire in the world is that of Great Britain, being 8,557,658 square miles, and more than a sixth part of the globe.

The first electrical signal ever transmitted between Europe and America passed over the Field submarine cable on Aug. 5, 1858.

The longest tunnel in the world is St. Gothard, on the line of the railroad between Lucerne and Milan, being 9½ miles in length.

The loftiest active volcano is Popocatapetl. It is 17,784 feet high, and has a crater three miles in circumference and 1,000 feet deep.

Burnt brick were known to have been used in building the Tower of Babel. They were introduced into England by the Romans.

The most remarkable echo known is that in the castle of Simonetta, two miles from Milan. It repeats the echo of a pistol sixty times.

The largest volcano in the world is Etna. Its base is 90 miles in circumference; its cone 11,000 feet high. Its first eruption occurred 474 B.C.

The largest tree in the world, as yet discovered, is in Tulare County, California. It is 275 feet high, and 106 feet in circumference at its base.

The largest desert is Sahara, in Northern Africa. Its length is 3,000 miles and breadth 900 miles; having an area of 2,000,000 square miles.

The largest suspension bridge is the Brooklyn. The length of the main span is 1,595 feet 6 inches. The entire length of the bridge is 5,989 feet.

The first deaf and dumb asylum was founded in England, by Thomas Braidwood, 1760; and the first in the United States was at Hartford, 1817.

The largest diamond in the world is the Braganza, being a part of the Portuguese jewels. It weighs 1,880 carats. It was found in Brazil in 1741.

The grade of titles in Great Britain stands in the following order from the highest: A Prince, Duke, Marquis, Earl, Viscount, Baron, Baronet, Knight.

The "Valley of Death," in the island of Java, is simply the crater of an extinct volcano, filled with carbonic-acid gas. It is half a mile in circumference.

The city of Amsterdam, Holland, is built upon piles driven into the ground. It is intersected by numerous canals, crossed by nearly three hundred bridges.

Coal was used as fuel in England as early as 852, and in 1234 the first charter to dig for it was granted by Henry III. to the inhabitants of Newcastle-on-Tyne.

Tobacco was discovered in San Domingo in 1496; afterwards by the Spaniards in Yucatan in 1520. It was introduced in France in 1560, and into England in 1583.

The present national colors of the United States were not adopted by Congress until 1777. The flag was first used by Washington at Cambridge, January 1, 1776.

Paris was known as Lutetia until 1184, when the name of the great French capital was changed to that which it has borne ever since.

The longest span of wire in the world is used for a telegraph in India over the river Ristuah. It is over 6,000 feet, and is stretched between two hills, 1,200 feet high.

The largest library in the world is in Paris, founded by Louis XIV. It contains 1,400,000 volumes, 175,000 manuscripts, 300,000 maps and charts, and 150,000 coins and medals.

The tallest man was John Hale, of Lancashire, England, who was nine feet six inches in height. His hand was seventeen inches long and eight and one-half inches broad.

In round numbers, the weight of $1,000,000 in standard gold coin is 1¾ tons; standard silver coin, 26¾ tons; subsidiary silver coin, 25 tons; minor coin, 5-cent nickel, 100 tons.

The part of United States territory most recently acquired is the island of San Juan, near Vancouver's Island. It was evacuated by England at the close of November, 1873.

The highest monument in the world is the Washington monument, being 555 feet. The highest structure of any kind is the Eiffel Tower, Paris, finished in 1889 and 989 feet high.

It is claimed that crows, eagles, ravens and swans live to be 100 years old; herons, 59; parrots, 60; pelicans and geese, 50; skylarks, 30; sparrow hawks, 40; peacocks, canaries and cranes, 24.

The greatest cataract in the world is Niagara, the height of the American Falls being 165 feet. The highest fall of water in the world is that of the Yosemite in California, being 2,550 feet.

The most ancient catacombs are those of the Theban kings, begun 4,000 years ago. The catacombs of Rome contain the remains of about 6,000,000 human beings; those of Paris, 3,000,000.

The quickest passage ever made across the Atlantic was that of the steamer Etruria, of the Cunard line, being 6 days 5 hours and 30 minutes from New York to Queenstown; the distance being 2,850 miles.

There has been no irregularity in the recurrence of leap year every four years since 1800, and will be none until 1900, which will be a common year, although it will come fourth after the preceding leap year.

The first English newspaper was the *English Mercury*, issued in the reign of Queen Elizabeth, and was issued in the shape of a pamphlet. The *Gazette* of Venice was the original model of the modern newspaper.

The Mormon Church in Utáh shows a membership of 127,294 —23,000 families. The church has 12 apostles, 58 patriarchs, 3,885 seventies, 3,153 high priests, 11,000 elders, 1,500 bishops, and 4,400 deacons, being an office for each six persons.

The seven sages flourished in Greece in the 6th century B.C. They were renowned for their maxims of life, and as the authors of the mottoes inscribed in the Delphian Temple. Their names are: Solon, Chilo, Pittacus, Bias, Periander, Cleobolus, and Thales.

The largest stationary engine in the world is at the zinc mines at Friedenville, Penn. The number of gallons of water raised every minute is 17,500. The driving wheels are 35 feet in diameter and weigh 40 tons each. The cylinder is 110 inches in diameter.

The largest number of cattle ever received in one year was that of Chicago in the year 1884, being 1,874,984 beeves, 30,223 calves, 5,640,625 hogs, 749,917 sheep, and 15,625 horses. It required 9,000 trains of 31 cars each, which, if coupled together, would reach 2,146 miles.

The estimated number of Christians in the world is over 408,000,000; of Buddhists, 420,000,000; of the followers of Brahma, 180,000,000; of Mohammedans, 150,000,000; of Jews, 8,000,000; of atheists, deists, and infidels, 85,000,000; of pagans, 50,000,000, and of the 1,100 other minor creeds, 123,000,000.

The largest producing farm in the world lies in the southwest corner of Louisiana, owned by a northern syndicate. It runs one hundred miles north and south. The immense tract is divided into convenient pastures, with stations of ranches every six miles. The fencing alone cost nearly $50,000.

The "Seven Wonders of the World" are seven most remarkable objects of the ancient world. They are: The Pyramids of Egpyt, Pharos of Alexandria, Walls and Hanging Gardens of Babylon, Temple of Diana at Ephesus, the Statue of the Olympian Jupiter, Mausoleum of Artemisia, and Colossus of Rhodes.

A "monkey wrench" is not so named because it is a handy thing to monkey with, or for any kindred reason. "Monkey" is not its name at all, but "Moncky." Charles Moncky, the inventor of it, sold his patent for $2,000, and invested the money in a house in Williamsburgh, Kings County, N. Y., where he now lives.

The Union arch of the Washington Aqueduct is the largest in the world, being 220 feet; 20 feet in excess of the Chester arch across the Dee in England, 68 feet longer than that of the London Bridge; 92 feet longer than that at Neuilly on the Seine, and 100 feet longer than that of Waterloo Bridge. The height of the Washington arch is 100 feet.

The largest ship ever built, the Great Eastern, recently broken to pieces and sold to junk dealers, was designed and constructed by Scott Russell, at Maxwell, on the Thames. Work on the giant vessel was commenced in May, 1854. She was successfully launched January 13, 1858. The launching alone occupied the time from November 3, 1857, until the date above given. Her total length was 600 feet; breadth, 118 feet; total weight when launched, 12,000 tons. Her first trip of any consequence was made to New York in 1859–60.

In 1775 there were only twenty-seven newspapers published in the United States. Ten years later, in 1785, there were seven published in the English language in Philadelphia alone, of which one was a daily. The oldest newspaper published in Philadelphia at the time of the Federal convention was the *Pennsylvania Gazette*, established by Samuel Keimer, in 1728. The second newspaper in point of age was the *Pennsylvania Journal*, established in 1742 by William Bradford, whose uncle, Andrew Bradford, established the first newspaper in Pennsylvania, the *American Weekly Mercury*, in 1719. Next in age, but the first in importance, was the *Pennsylvania Packet*, established by John Dunlap in 1771. In 1784 it became a daily, being the first daily newspaper printed on this continent.

Statistics of twenty leading libraries in this country show that, of over $500,000 spent, a little over $170,000 spent was devoted to books, while other expenses consumed $358,000. In the Mercantile Library of New York city it costs 14 cents to circulate a volume; in the Astor, 14½ cents are spent on each volume, or 27 cents on each reader; in Columbia College Library, 21½ cents per reader; in the Library Company of Philadelphia, 26 cents per volume, or 10 cents per head. The largest library in the world is the National Library of France, founded by Louis XIV., which now contains 1,400,000 books, 300,000 pamphlets, 175,000 manuscripts, 300,000 maps and charts, 150,000 coins and medals, 1,300,000 engravings, and 100,000 portraits. The Library of Congress is the largest in this country, as it contained 570,000 volumes in 1886. The Mercantile Library of Philadelphia was the seventh in point of size in this country in the same year. There are in the United States 5,338 libraries.

The most extensive mines in the world are those of Freiberg, Saxony. They were begun in the twelfth century, and in 1835 the galleries, taken collectively, had reached the unprecedented length of 123 miles. A new gallery, begun in 1838, had reached a length of eight miles at the time of the census of 1878. The deepest perpendicular mining shaft in the world is located at Prizilram, Bohemia. It is a lead mine; it was begun 1832. January, 1880, it was 3,280 feet deep. The deepest coal mine in the world is near Tourney, Belgium; it is 3,542 feet in depth, but, unlike the lead mine mentioned above, it is not perpendicular. The deepest rock-salt bore in the world is near Berlin, Prussia; it is 4,185 feet deep. The deepest hole ever bored into the earth is the artesian well at Potsdam, which is 5,500 feet in depth. The deepest coal mines in England are the Dunkirk collieries of Lancashire, which are 2,824 feet in depth. The deepest coal shaft in the United States is located at Pottsville, Pa. In 1885 it had reached a depth of 1,576 feet. From this great depth 400 cars, holding four tons each, are hoisted daily. The deepest silver mine in the United States is the Yellow Jacket, one of the great Comstock system at Virginia City, Nevada; the lower levels are 2,700 feet below the hoisting works.

The largest locomotive ever constructed prior to 1880 was that made at the Baldwin Locomotive Works during the early part of 1879. It was turned out ready for use April 10th of that year and named Uncle Dick. Uncle Dick weighed 130,000 pounds; was sixty feet from headlight to the rear end of the tender. He is now at work on the Atchison, Topeka & Santa Fe road. During the year 1883 the same works that constructed Uncle Dick turned out several locomotives for the Northern Pacific railroad, each weighing 180,000 pounds. During the same year, as if to overshadow the Baldwin works, the Central Pacific company caused to be built at their shops in Sacramento, Cal., what are really the largest locomotives in the world. They have eight drive-wheels each, the cylinders are 19 inches in diameter, and the stroke three feet. These engines weigh, with the tender, as Uncle Dick's weight was given, almost 190,000 pounds. The Baldwin Works, in 1889, completed for the Northern Pacific an engine weighing, with tender, 225,000 pounds.

"Liberty," Bartholdi's statue, presented to the United States by the French people in 1885, is the largest statue ever built. Its conception is due to the great French sculptor whose name it bears. It is said to be a likeness of his mother. Eight years of time were consumed in the construction of this gigantic brazen image. Its weight is 440,000 pounds, of which 146,000 pounds are copper, the remainder iron and steel. The major part of the iron and steel was used in constructing the skeleton frame work for the inside. The mammoth electric light held in the hand of the giantess is 305 feet above tide-water. The height of the figure is 152½ feet; the pedestal 91 feet, and the foundation 52 feet and 10 inches. Forty persons can find standing-room within the mighty head, which is 14½ feet in diameter. A six-foot man standing on the lower lip could hardly reach the eyes. The index finger is eight feet in length and the nose 3¾ feet. The Colossus of Rhodes was a pigmy compared with this latter day wonder.

The largest stone bridge on the face of the earth is that finished in May, 1885, at Lagang, China. Chinese engineers had sole control of its construction. It crosses an arm of the China Sea, is nearly six miles in length, is composed entirely of stone, and has 300 arches, each 70 feet high. It is the most colossal structure ever reared by man, yet we sneer at the "heathen Chinee." The largest truss iron bridge in the world crosses the Firth of Tay, Scotland. It is 18,612 feet in length and composed of eighty-five spans. The longest wooden bridge in the world is that crossing Lake Ponchartrain, near New Orleans, La. It is a trestle-work twenty-one miles in length, built of cypress piles which have been saturated with creosote oil to preserve them. The highest bridge in the United States is over Kinzina Creek, near Bradford, Pa. It was built in 1882, has a total span of 2,051 feet and is 301 feet above the creek bed.

The "Centennial ox," bred by Samuel Barkley of Somerset County, Pa., was the largest specimen of the bovine the world has ever seen. He weighed 4,900 pounds the day he arrived in Philadelphia. This mountain of beef was of mixed stock, being short-horn, native, "scrub," and Ayrshire, the short-horn predominating. After the exhibition was ended the giant ox was butchered and exhibited as "show beef" at Philadelphia during the holidays of 1876. A short-horn steer weighing 4,100 pounds was slaughtered at Detroit in 1874. A. N. Meal of Moberly, Mo., formerly owned the largest cow in the world. Mr. Meal disposed of her in 1883, the Cole Circus Company being the purchasers. She weighed the day of sale 3,296 pounds. Mr. John Pratt of Chase County, Kan., was formerly the owner of a cow weighing 3,200 pounds. She was of the common "scrub" stock and stood nineteen hands high.

The great pyramid of Cheops is the largest structure of any kind ever erected by the hand of man. Its original dimensions at the base were 764 feet square, and its perpendicular height in the highest point 488 feet; it covers four acres, one rood, and twenty-two perches of ground and has been estimated by an eminent English architect to have cost not less than £30,000,000, which in United States currency would be about $145,200,000. Internal evidence proves that the great pyramid was begun about the year 2170 B.C., about the time of the birth of Abraham. It is estimated that about 5,000,000 tons of hewn stone were used in its construction, and the evidence points to the fact that these stones were brought a distance of about 700 miles from quarries in Arabia.

The largest and grandest temple of worship in the world is the St. Peter's Cathedral at Rome. It stands on the site of Nero's circus, in the northwest part of the city, and is built in form of a Latin cross. The total length of the interior is 612½ English feet; transept, 446½ feet; height of nave, 152½ feet; diameter of cupalo, 193 feet; height of dome from pavement to top of cross, 448 feet. The great bell alone without the hammer or clapper weighs 18,600 pounds, or over 9¼ tons. The foundation was laid in 1450 A.D. Forty-three Popes lived and died during the time the work was in progress. It was dedicated in the year 1826, but not entirely finished until the year 1880. The cost, in round numbers, is set down at $70,000,000.

The Capitol building at Washington, D. C., is the largest building in the United States. The corner stone was laid December 18th, 1793, by President Washington, assisted by other Masons. It was partially destroyed by the British in 1814. The present dome was begun in 1855 and finished in 1863. The flag of the United States first floated from it December 12th, 1863. The cost of the entire building has been something over $13,000,000. Its length is 715 feet 4 inches; width, 324 feet. It covers 3½ acres of ground. The distance from the ground to the top of the dome is 307½ feet; diameter of the dome, 135½ feet—making fifth as to size with the greatest domes of the world.

The largest and costliest private mansion in the world is that belonging to Lord Bute, called Montstuart, and situated near Rothesay, England. It covers nearly two acres; is built in gothic style; the walls, turrets and balconies are built of stone. The immense tower in the center of the building is 120 feet high, with a balcony around the top. The halls are constructed entirely of marble and alabaster, and the rooms are finished in mahogany, rosewood and walnut. The fire-places are all carved marbles of antique design. The exact cost of this fairy palace is not known, but it has never been estimated at less than $8,000,000.

The largest body of fresh water in the world is Lake Superior. It is 400 miles long and 180 miles wide; its circumference, including the windings of its various bays, has been estimated at 1,800 miles. Its area in square miles is 32,000, which is greater than the whole of New England, leaving out Maine. The greatest depth of this inland sea is 200 fathoms, or 1,200 feet. Its average depth is about 160 fathoms. It is 636 feet above sea level.

The corner stone of the Washington monument, the highest in the United States, and until 1889 the highest in the world, was laid July 4th, 1848. Robert E. Winthrop, then the Speaker of the House, delivered the oration. Work progressed steadily for about six years, until the funds of the monumental society became exhausted. At that time the monument was about 175 feet high. From 1854 until 1879 nothing to speak of was done on the building. In the year last above named Congress voted an appropriation of $200,000 to complete the work. From that time forward work progressed at a rapid rate until December 6th, 1884, when the aluminum apex was set at 555 feet 5½ inches from the foundation and the work declared finished. The foundation is 146½ feet square; number of stones used above the 130-foot level, 9,163; total weight stone used in work, 81,120 tons.

The famous Corliss engine, the largest ever constructed, and the one used to drive the machinery in the great hall at the Centennial of 1876, is now in the shops of the Pullman Car Company at Pullman, near Chicago, Ill. The writer is aware that this differs from other statements that have been made, it being generally supposed that the Emperor of Brazil bought the engine and removed it to his own country. He did talk of buying it, but the bargain was never consummated. This tireless giant works in an upright position, is over 40 feet high, of 1,400 horse-power, and has two 40-inch cylinders and a 10-foot stroke.

The largest ferry-boat ever constructed was named the Solano, and is now in use daily conveying trains across the Straits of Carquinez, between Benecia and Port Costa. The Solano is 460 feet long, 116 feet wide, and 20 foot depth of hold. She has eight steel boilers, four rudders, and a tonage of 3,841 tons. On her decks are four railway tracks, with capacity for 48 ordinary freight cars and two locomotives, or 28 passenger coaches of the largest build.

The highest building in the world, not counting the Eiffel tower and the Washington monument, is the Cologne cathedral. The height from the pavement to the top of the cupola is 511 feet. It is 511 feet long, exactly the same as the height, and 231 feet wide. It was begun August 15th in the year 1248, and was pronounced finished August 14th, 1880, over 600 years after the corner stone was laid.

The highest mountain on the globe is not, as is generally supposed, Mt. Everest, that honor belonging to a lofty peak named Mt. Hercules on the Isle of Papua, New Guinea, discovered by Capt. Lawson in 1881. According to Lawson, this monster is 32,763 feet in height, being 3,781 feet higher than Mt. Everest, which is only 29,002 feet above the level of the Indian ocean.

The largest State in our grand republic is Texas, which contains 274,356 square miles, capable of sustaining 20,000,000 of people, and then it would not be more crowded than Scotland is at present. It ha been estimated that the entire population of the globe could be seated upon chairs within the boundary of Texas and each have f ur feet of elbow room.

The largest anvil is that used in the Woolwich Arsenal, England. It weighs sixty tons. The anvil block upon which it rests weighs 103 tons. Altogether 600 tons of iron were used in the anvil, the block and the foundation work. It is said to have been six months cooling before it was sufficiently hard to stand the shock of the immense hammer.

The Mississippi river, from the source of the Missouri to the Eads jetties, is the longest river in the world. It is 4,300 miles in length and drains an area of 1,726,000 square miles. The Amazon, which is without doubt the widest river in the world, including the Beni, is 4,000 miles in length and drains 2,330,000 square miles of territory.

The largest school in the world is the Jews' free school of Spitalsfield, Eng., which has a daily attendance of 2,800 pupils.

New Orleans boasts the largest custom-house in this or any other land. It was begun in 1848 and over thirty years elapsed before it was finished and ready for use. It is built of Quincy granite, the interior being finished in finest marble. It has 111 rooms; height from the pavement to the top of the cornice is eighty feet, and to the top of the light on the dome 187 feet. The dome itself is 49 feet square and 61 feet high; estimated total cost of building, $4,900,000.

The largest hotel in the United States, and probably the largest in the world, is located at San Francisco, Cal. It is nine stories high and cost $3,500,000. It is named the Palace and has accommodations for 1,500 guests.

Paris claims the finest theater in the world. It is of solid stone, finished with marble floors, and covers about four acres of ground. La Scala, of Milan, has the largest seating capacity, while the Auditorium at Chicago, completed in 1889, seating 7,000 people, ranks second in that respect.

The Name of God in Forty-eight Languages.

Hebrew	Eleah, Jehovah	Olotu tongue	Deu
Chaldaic	Eiliah	German and Swiss	Gott
Assyrian	Eleah	Flemish	God
Syrian and Turkish	Alah	Dutch	God
Malay	Alla	English	God
Arabic	Allah	Teutonic	Goth
Languages of the Magi	Orsi	Danish and Swedish	Gud
Old Egyptian	Teut	Norwegian	Gud
Armenian	Teuti	Slav	Buch
Modern Egyptian	Teun	Polish	Bog
Greek	Theos	Polacca	Bung
Cretan	Thios	Lapp	Jubinal
Aedian and Dorian	Ilos	Finnish	Jumala
Latin	Deus	Runic	As
Low Latin	Diex	Zemblian	Fetiza
Celtic Gaelic	Diu	Pannonian	Istu
French	Dieu	Hindostanee	Rain
Spanish	Dios	Coromandel	Brama
Portuguese	Deos	Tartar	Magatai
Old German	Diet	Persian	Sire
Provincial	Diou	Chinese	Prussa
Low Breton	Done	Japanese	Goezer
Italian	Dio	Madagascar	Zannar
Irish	Dia	Peruvian	Puchecammae

COMPARATIVE COST OF FREIGHT BY WATER AND RAIL.—It has been proved by actual test that a single tow-boat can transport at one trip from the Ohio to New Orleans 29,000 tons of coal, loaded in barges. Estimating in this way, the boat and its tow, worked by a few men, carries as much freight to its destination as 3,000 cars and 100 locomotives, manned by 600 men, could transport.

LOISETTE'S SYSTEM OF MEMORY.

SO MUCH has been said about Loisette's memory system, the art has been so widely advertised, and so carefully guarded from all the profane who do not send five or many dollars to the Professor, that a few pages showing how every man may be his own Loisette, may be both interesting and valuable.

In the first place, the system is a good one, and well worth the labor of mastering, and if the directions are implicitly followed there can be no doubt that the memory will be greatly strengthened and improved, and that mnemonic feats otherwise impossible may be easily performed. Loisette, however, is not an inventor, but an introducer. He stands in the same relation to Dr. Pick that the retail dealer holds to the manufacturer: the one produced the article; the other brings it to the public. Even this statement is not quite fair to Loisette, for he has brought much practical common sense to bear upon Pick's system, and, in preparing the new art of mnemonics for the market, in many ways he has made it his own.

If each man would reflect upon the method by which he himself remembers things, he would find his hand upon the key of the whole mystery. For instance, the author was once trying to remember the word *blythe*. There occurred to my mind the words "Bellman," "Belle," and then the verse:

> "—— the peasant upward climbing
> Hears the bells of *Buloss* chiming."

"Barcarole," "Barrack," and so on until finally the word "blythe" presented itself with a strange insistance, long after I had ceased trying to recall it.

On another occasion, when trying to recall the name "Richardson," I got the words "hay-rick," "Robertson," "Randallstown," and finally "wealthy," from which, naturally, I got "rich" and "Richardson" almost in a breath.

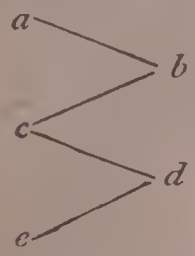
Still another example: trying to recall the name of an old schoolmate, "Grady," I got "Brady," "grave," "gaseous," "gastronome," "gracious," and I finally abandoned the attempt, simply saying to myself that it began with a "G," and there was an "a" sound after it. The next morning, when thinking of something entirely different, this name "Grady" came up in my mind with as much distinctness as though someone had whispered it in my ear. This remembering was done without any conscious effort on my part, and was evidently the result of the exertion made the day before when the mnemonic processes were put to work. Every reader must have had a similar experience which he can recall, and which will fall in line with the examples given

It follows, then, that when we endeavor, without the aid of any system, to recall a forgotten fact or name, our memory presents to us words of similar sound or meaning in its journey toward the goal to which we have started it. This goes to show that our ideas are arranged in groups in whatever secret cavity or recess of the brain they occupy, and that the arrangement is one not alphabetical exactly, and not entirely by meaning, but after some fashion partaking of both.

If you are looking for the word "meadow" you may reach "middle" before you come to it, or "Mexico," or many words beginning with the "m" sound, or containing the "dow," as "window" or "dough," or you may get "field" or "farm"—but you are on the right track, and if you do not interfere with your intellectual process you will finally come to the idea which you are seeking.

How often have you heard people say, "I forget his name, it is something like Beadle or Beagle—at any rate it begins with a B." Each and all of these were unconscious Loisettians, and they were practicing blindly, and without proper method or direction, the excellent system which he teaches. The thing, then, to do—and it is the final and simple truth which Loisette teaches—is to travel over this ground in the other direction—to cement the fact which you wish to remember to some other fact or word which you know will be brought out by the implied conditions—and thus you will always be able to travel from your given starting-point to the thing which you wish to call to mind.

To illustrate: let the broken line in the annexed diagram represent a train of thought. If we connect the idea "*a*" with "*e*" through the steps *b*, *c* and *d*, the tendency of the mind ever afterwards will be to get to *e* from *a* that way, or from any of the intermediates that way. It seems as though a channel were cut in our mind-stuff along which the memory flows. How to make it flow this way will be seen later on. Loisette, in common with all the mnemonic teachers, uses the old device of representing numbers by letters—and as this is the first and easiest step in the art, this seems to be the most logical place to introduce the accepted equivalents of the Arabic numerals:



0 is always represented by *s*, *z* or *c* soft.
1 is always represented by *t*, *th* or ***d***.
2 is always represented by *n*.
3 is always represented by *m*.
4 is always represented by *r*.
5 is always represented by *l*.
6 is always represented by *sh*. *j*, *ch* soft or *g* soft.

7 is always represented by *g* hard, *k* *c* hard, *q* or final *ng*.
8 is always represented by *f* or *v*.
9 is always represented by *p* or *b*.

All the other letters are used simply to fill up. Double letters in a word count only as one. In fact the sytem goes by sound, not by spelling—for instance "this" or "dizzy" would stand for *ten;* "catch" or "gush" would stand for 76. and the only difficulty is to make some word or phrase which will contain only the significant letters in the proper order, filled out with non-significants into some guise of meaning or intelligibility.* Suppose you wished to get some phrase or word that would express the number 3685, you arrange the letters this way :

	3	⌢	**6**	⌢	**8**	⌢	**5**
a	m	a	sh	a	f	a	l
e		e	j	e	v	e	
i		i	ch	i		i	
o		o	g	o		o	
u		u		u		u	
h		h		h		h	
w		w		w		w	
x		x		x		x	
y		y		y		y	

You can make out "image of law," "my shuffle," "matchville," etc., etc., as far as you like to work it out.

Now, suppose you wished to memorize the fact that $1,000,000 in gold weighs 3,685 pounds, you go about it in this way, and here is the kernel and crux of Loisette's system :

"How much does $1,000,000 in gold weigh ?"

"Weigh—scales."

"Scales—statue of Justice."

"Statue of Justice—*image of law*."

The process is simplicity itself. The thing you wish to recall, and that you fear to forget, is the weight; consequently you cement your chain of suggestion to the idea which is most

*You can remember the equivalents by noting the fact that *z* is the first letter of "zero," and *c* of "cipher," *t* has but one stroke, *n* has two, *m* three. The script *f* is very like 8, the script *p* like 9; *r* is the last letter of four, *l* is the roman numeral for *fifty*, which suggests *five*. The others may be retained as memorizing these two nonsense lines:

Six *shy* Jewesses *ch*ase George
Seven *g*reat *k*ings *c*ame *q*uarrel*ing*.

prominent in your mental question. What do you weigh with? Scales. What does the mental picture of scales suggest? The statue of Justice, blindfolded and weighing out award and punishment to man. Finally, what is this statue of Justice but the image of law? and the words "image of law," translated back from the significant letters *m*, *g* soft, *f* and *l*, give you 3–6–8–5, the number of pounds in $1,000,000 in gold. You bind together in your mind each separate step in the journey, the one suggests the other, and you will find a year from now that the fact will be as fresh in your memory as it is to-day. You cannot lose it. It is chained to you by an unbreakable mnemonic tie. Mark, that it is not claimed that "weight" will of itself suggest "scales" and "scales" "statue of Justice," etc., but that, having once passed your attention up and down that ladder of ideas, your mental tendency will be to take the same route, and get to the same goal again and again. Indeed, beginning with the weight of $1,000,000, "image of law" will turn up in your mind without your consciousness of any intermediate station on the way, after some iteration and reiteration of the original chain.

Again, so as to fasten the process in the reader's mind even more firmly, suppose that it were desired to fix the date of the battle of Hastings (A. D. 1066) in the memory; 1066 may be represented by the words "the wise judge" (*th* = 1, *s* = 0, *j* = 6, *dg* = 6; the others are non-significants); a chain might be made thus:

Battle of Hastings—arbitrament of war.
Arbitrament of war—arbitration.
Arbitration—judgment.
Judgment—the wise judge.

Make mental pictures, connect ideas, repeat words and sounds, go about it any way you please, so that you will form a mental habit of connecting the "battle of Hastings" with the idea of "arbitrament of war," and so on for the other links in the chain, and the work is done.

Loisette makes the beginning of his system unnecessarily difficult, to say nothing of his illogical arrangement in the grammar of the art of memory, which he makes the first of his lessons. He analyzes suggestion into—

1. Inclusion.
2. Exclusion.
3. Concurrence.

All of which looks very scientific and orderly, but is really misleading, and badly named. The truth is that one idea will suggest another.

1. By likeness or opposition of meaning, as "house" suggests

"room" or "door," etc.; or, "white" suggests "black," "cruel," "kind," etc.

2. By likeness of sound, as "harrow" and "barrow"; "Henry" and "Hennepin."

3. By mental juxtaposition, a peculiarity different in each person, and depending upon each one's own experiences. Thus, "St. Charles" suggests "railway bridge" to me, because I was vividly impressed by the breaking of the Wabash bridge at that point. "Stable" and "broken leg" come near each other in my experience, so do "cow" and "shot-gun" and "licking."

Out of these three sorts of suggestion it is possible to get from any one fact to any other in a chain certain and safe, along which the mind may be depended upon afterwards always to follow.

The chain is, of course, by no means all. Its making and its binding must be accompanied by a vivid, methodically directed attention, which turns all the mental light gettable in a focus upon the subject passing across the mind's screen. Before Loisette was thought of this was known. In the old times in England, in order to impress upon the mind of the rising generation the parish boundaries in the rural districts, the boys were taken to each of the landmarks in succession, the position and bearings of each pointed out carefully, and, in order to deepen the impression, the young people were then and there vigorously thrashed, a mechanical method of attracting the attention which was said never to have failed. This system has had its supporters in many of the old-fashioned schools, and there are men who will read these lines who can recall, with an itching sense of vivid expression, the 144 lickings which were said to go with the multiplication table.

In default of a thrashing, however, the student must cultivate as best he can an intense fixity of perception upon every fact or word or date that he wishes to make permanently his own. It is easy. It is a matter of habit. If you will you can photograph an idea upon your cerebral gelatine so that neither years nor events will blot it out or overlay it. You must be clearly and distinctly aware of the thing you are putting into your mental treasure-house, and drastically certain of the cord by which you have tied it to some other thing of which you are sure. Unless it is worth your while to do this, you might as well abandon any hope of mnemonic improvement, which will not come without the hardest kind of hard work, although it is work that will grow constantly easier with practice and reiteration.

You need, then:

1. Methodic suggestion.
2. Methodic attention
3. Methodic reiteration.

And this is all there is to Loisette, and a great deal it is. Two of them will not do without the third. You do not know how many steps there are from your hall door to your bed-room, though you have attended to and often reiterated the journey. But if there are twenty of them, and you have once bound the word "nice," or "nose," or "news," or "hyenas," to the fact of the stairway, you could never forget it.

The Professor makes a point, and very wisely, of the importance of working through some established chain, so that the whole may be carried away in the mind—not alone for the value of the facts so bound together, but for the mental discipline so afforded.

Here, then, is the "President Series," which contains the name and the date of inauguration of each president from Washington to Cleveland. The manner in which it is to be mastered is this: Beginning at the top, try to find in your mind some connection between each word and the one following it. See how you can at some future time make one suggest the next, either by suggestion of sound or sense, or by mental juxtaposition. When you have found this dwell on it attentively for a moment or two. Pass it backward and forward before you, and then go on to the next step.

The chain runs thus, the names of the presidents being in small caps, the date words in italics:

President.....Chosen as the first word as the one most apt to occur to the mind of any one wishing to repeat the names of the presidents.
Dentist.....Presi*dent* and *dent*ist.
Draw.....What does a dentist do?
To give up.....When something is drawn from one it is given up. This is a date phrase meaning 1789.
Self-sacrifice.....There is an association of thought between giving up and self-sacrifice.
WASHINGTON.....Associate the quality of self-sacrifice with Washington's character.
Morning wash.....*Wash*ington and *wash*.
Dew.....Early wetness and dew.
Flower beds.....Dew and flowers.
Took a bouquet.....Flowers and bouquet. Date phrase (1797).
Garden.....Bouquet and garden.
Eden.....The first garden.
Adam.....Juxtaposition of thought.
ADAMS.....Suggestion by sound.
Fall.....Juxtaposition of thought.
Failure.....Fall and failure.
Deficit.....Upon a failure there is usually a deficit. Date word (1801).
Debt.....The consequence of a deficit.
Bonds.....Debt and bonds.
Confederate bonds..Suggestion by meaning.
Jefferson Davis.....Juxtaposition of thought.
JEFFERSON.

Now follow out the rest for yourself, taking about ten at a time, and binding those you do last to those you have done before each time, before attacking the next bunch.

1	2	3
JEFFERSON	*the fraud*	*the heavy shell*
Judge Jeffreys	painted clay	mollusk
bloody assize	baked clay	unfamiliar word
bereavement	tiles	dictionary
too heavy a sob	TYLER	Johnson's
parental grief	Wat Tyler	JOHNSON
mad son	poll tax	son
MADISON	compulsory	bad son
Madeira	*free will*	dishonest boy
first-rate wine	free offering	*thievish boy*
frustrating	burnt offering	take
defeating	poker	give
feet	POLK	GRANT
toe the line	end of dance	award
row	termination "ly"	school premium
MONROE	*adverb*	examination
row	part of speech	cramming
boat	part of a man	*fagging*
steamer	TAYLOR	laborer
the funnel	measurer	hay field
windpipe	theodolite	HAYES
throat	*Theophilus*	hazy
quinzy	fill us	clear
QUINCY ADAMS	FILLMORE	*vivid*
quince	more fuel	brightly lighted
fine fruit	*the flame*	camp fire
the fine boy	flambeau	war field
sailor boy	bow	GARFIELD
sailor	arrow	Guiteau
jack tar	PIERCE	murderer
JACKSON	hurt	prisoner
stone wall	*feeling*	prison fare
indomitable	wound	*half fed*
tough make	soldier	well fed
oaken furniture	cannon	well read
bureau	BUCHANAN	author
VAN BUREN	rebuke	ARTHUR
rent	official censure	round table
side-splitting	*to officiate*	tea table
divert	wedding	tea cup
annoy	linked	*half full*
harassing	LINCOLN	divide
HARRISON	link	cleave
Old Harry	stroll	CLEVELAND
the tempter	sea shore	

It will be noted that some of the date words, as "free will," only give three figures of the date, 845; but it is to be supposed that if the student knows that many figures in the date of Polk's inauguration he can guess the other one.

The curious thing about this system will now become apparent. If the reader has learned the series so that he can say it down, from President to Cleveland, he can with no effort, and without any further preparation, say it *backwards* from Cleveland up to the commencement! There could be no better proof that this is the natural mnemonic system. It proves itself by its works.

The series should be repeated backwards and forwards every day for a month, and should be supplemented by a series of the reader's own making, and by this one, which gives the numbers from 0 to 100, and which must be chained together before they can be learned.

	0—hoes	
1—wheat	34—mare	67—jockey
2—hen	35—mill	68—shave
3—home	36—image	69—ship
4—hair	37—mug	70—eggs
5—oil	38—muff	71—gate
6—shoe	39—mob	72—gun
7—hook	40—race	73—comb
8—off	41—hart	74—hawker
9—bee	42—horn	75—coal
10—daisy	43—army	76—cage
11—tooth	44—warrior	77—cake
12—dine	45—royal	78—coffee
13—time	46—arch	79—cube
14—tower	47—rock	80—vase
15—dell	48—wharf	81—feet
16—ditch	49—rope	82—vein
17—duck	50—wheels	83—fame
18—dove	51—lad	84—fire
19—tabby	52—lion	85—vial
20—hyenas	53—lamb	86—fish
21—hand	54—lair	87—fig
22—nun	55—lily	88—fife
23—name	56—lodge	89—fib
24—owner	57—lake	90—pies
25—nail	58—leaf	91—putty
26—hinge	59—elbow	92—pane
27—ink	60—chess	93—bomb
28—knife	61—cheat	94—bier
29—knob	62—chain	95—bell
30—muse	63—sham	96—peach
31—mayday	64—chair	97—book
32—hymen	65—jail	98—beef
33—mama	66—judge	99—pope
	100—disease	

By the use of this table, which should be committed as thoroughly as the President series, so that it can be repeated backwards and forwards, any date, figure or number can be at once constructed, and bound by the usual chain to the fact which you wish it to accompany.

When the student wishes to go farther and attack larger problems than the simple binding of two facts together, there is little in Loisette's system that is new, although there is much that is good. If it is a book that is to be learned as one would prepare for an examination, each chapter is to be considered separately. Of each a *precis* is to be written in which the writer must exercise all of his ingenuity to reduce the matter in hand to its final skeleton of fact. This he is to commit to memory both by the use of the chain and the old system of interrogation. Suppose after much labor through a wide space of language one boils a chapter or an event down to the final irreducible sediment: "Magna Charta was exacted by the barons from King John at Runnymede."

You must now turn this statement this way and that way; asking yourself about it every possible and impossible question, gravely considering the answers, and, if you find any part of it especially difficult to remember, chaining it to the question which will bring it out. Thus, "What was exacted by the barons from King John at Runnymede?" "Magna Charta." "By whom was Magna Charta exacted from King John at Runnymede?" "By the barons." "From whom was," etc., etc.? "King John." "From what king," etc., etc.? "King John." "Where was Magna Charta," etc., etc.? "At Runnymede."

And so on and so on, as long as your ingenuity can suggest questions to ask, or points of view from which to consider the statement. Your mind will be finally saturated with the information, and prepared to spill it out at the first squeeze of the examiner. This, however, is not new. It was taught in the schools hundreds of years before Loisette was born. Old newspaper men will recall in connection with it Horace Greeley's statement that the test of a news item was the clear and satisfactory manner in which a report answered the interrogatories, "What?" "When?" "Where?" "Who?" "Why?"

In the same way Loisette advises the learning of poetry, *e. g.*,

"The Assyrian came down like a wolf on the fold."

"Who came down?"

"How did the Assyrian come down?"

"Like what animal did?" etc.

And so on and so on, until the verses are exhausted of every scrap of information to be had out of them by the most assiduous cross-examination.

Whatever the reader may think of the availability or value of this part of the system, there are so many easily applicable tests of the worth of much that Loisette has done, that it may be taken with the rest.

Few people, to give an easy example, can remember the value of π—the ratio between the circumference and the diameter of the circle—beyond four places of decimals, or at most six—3.141592+. Here is the value to 108 decimal places:

3.14159265·3589793238·4626433832·7950288419·7169399375·10582
09749·4459230781·6406286208·9986280348·2534211706·79821480
86+

By a very simple application of the numerical letter values these 108 decimal places can be carried in the mind and recalled about as fast as you can write them down. All that is to be done is to memorize these nonsense lines:

Mother Day will buy any shawl.
My love pick up my new muff.
A Russian jeer may move a woman.
Cables enough for Utopia.
Get a cheap ham pie by my cooley.
The slave knows a bigger ape.
I rarely hop on my sick foot.
Cheer a sage in a fashion safe.
A baby fish now views my wharf.
Annually Mary Ann did kiss a jay.
A cabby found a rough savage.

Now translate each significant into its proper value and you have the task accomplished. "Mother Day," $m=3$, $th=1$, $r=4$ $d=1$, and so on. Learn the lines one at a time by the method of interrogatories. "Who will buy any shawl?" "Which Mrs. Day will buy a shawl?" "Is Mother Day particular about the sort of shawl she will buy?" "Has she bought a shawl?" etc., etc. Then cement the end of each line to the beginning of the next one, thus, "Shawl"—"warm garment"—"warmth"—"love"—"my love," and go on as before. Stupid as the work may seem to you, you can memorize the figures in fifteen minutes this way so that you will not forget them in fifteen years. Similarly you can take Haydn's Dictionary of Dates and turn fact after fact into nonsense lines like these which you cannot lose.

And this ought to be enough to show anybody the whole art. If you look back across the sands of time and find out that it is that ridiculous old "Thirty days hath September" which comes to you when you are trying to think of the length of October—if you can quote your old prosody,

"O datur ambiguis," etc.,

with much more certainty than you can serve up your Horace; if,

in fine, jingles and alliterations, wise and otherwise, have stayed with you, while solid and serviceable information has faded away, you may be certain that here is the key to the enigma of memory.

You can apply it yourself in a hundred ways. If you wish to clinch in your mind the fact that Mr. Love lives at 485 Dearborn Street, what is more easy than to turn 485 into the word "rifle" and chain the ideas together, say thus: "LOVE—happiness—good time—picnic—forest—wood rangers—range—rifle range—*rifle*—fine weapon—costly weapon—dearly bought—DEARBORN."

Or if you wish to remember Mr. Bowman's name, and you notice he has a mole on his face which is apt to attract your attention when you next see him, cement the ideas thus: "Mole, mark, target, archer, Bowman."

THE COPYING PAD.—Put 1 ounce of glue to soak in cold water until pliable and soft. Drain off the surplus water and place the dish in another dish containing hot water. When the glue is thoroughly melted, add 6 ounces of glycerine, which has been previously heated, and mix the two, adding a few drops of carbolic acid to prevent molding. Pour out this mixture into a shallow pan (9x12 inches) and set away to cool, taking care that the surface is free from blisters. After standing 12 hours it is ready for use. To use, write on a sheet of paper what you wish to duplicate with a sharp steel pen and strong aniline ink. When dry, lay the paper face down on the pad, pressing it lightly, and allow it to remain for a moment. On removing the paper an impression will be found on the face of the pad, and if another paper is placed upon it, it will receive a similar impression. When enough impressions have been taken, the face of the pad should be immediately washed with a sponge and cold water until the ink impression is wholly removed. If the surface of the pad becomes dry, wipe it with a moist sponge, and, if uneven, melt over a slow fire.

HOW TO RAISE THE BODY OF A DROWNED PERSON.—In a recent failure to recover the body of a drowned person in New Jersey, a French-Canadian undertook the job, and proceeded as follows: Having supplied himself with some glass gallon jars and a quantity of unslacked lime he went in a boat to the place where the man was seen to go down. One of the jars was filled half full of lime, and then filled up with water and tightly corked. It was then dropped into the water and soon after exploded at the bottom of the river with a loud report. After the third trial, each time at a different place, the body rose to the surface and was secured.

500 ERRORS CORRECTED.

Concise Rules in Grammar, Spelling and Pronunciation.

THERE are several kinds of errors in speaking. The most objectionable of them all are those in which words are employed that are unsuitable to convey the meaning intended. Thus, a person wishing to express his intention of going to a given place says, "I *propose* going," when, in fact, he *purposes* going. The following affords an amusing illustration of this class of error: A venerable matron was speaking of her son, who, she said, was quite stage-struck. "In fact," remarked the old lady, "he is going to a *premature* performance this evening!" Considering that most *amateur* performances are *premature*, it cannot be said that this word was altogether misapplied; though, evidently, the maternal intention was to convey quite another meaning.

Other errors arise from the substitution of sounds similar to the words which should be employed; that is, spurious words instead of genuine ones. Thus, some people say "*renumerative*," when they mean "*remunerative*." A nurse, recommending her mistress to have a *perambulator* for her child, advised her to purchase a *preamputator!*

Other errors are occasioned by imperfect knowledge of the English grammar: thus, many people say, "Between you and I," instead of "Between you and *me*." And there are numerous other departures from the rules of grammar, which will be pointed out hereafter.

MISUSE OF THE ADJECTIVE: "What *beautiful* butter!" "What a *nice* landscape!" They should say "What a *beautiful landscape!*" "What *nice butter!*" Again, errors are frequently occasioned by the following causes:

MISPRONUNCIATION OF WORDS: Many persons say *pronounciation* instead of *pronunciation;* others say pro-nun-ce-a-shun, instead of pro-nun-she-a-shun.

MISDIVISION OF WORDS AND SYLLABLES: This defect makes the words *an ambassador* sound like *a nambassador*, or *an adder* like *a nadder*.

IMPERFECT ENUNCIATION, as when a person says *hebben* for *heaven*, *ebber* for *ever*, *jocholate* for *chocolate*.

To correct these errors by a systematic course of study would involve a closer application than most persons could afford, but the simple and concise rules and hints here given, founded upon usage and the authority of scholars, will be of great assistance to inquirers.

RULES AND HINTS FOR CORRECT SPEAKING.

Who and *whom* are used in relation to persons, and *which* in relation to things. But it was once common to say, "the man *which*." This should now be avoided. It is now usual to say, "Our Father *who* art in heaven," instead of "*which* art in heaven."

Whose is, however, sometimes applied to things as well as to persons. We may therefore say, "The country *whose* inhabitants are free."

Thou is employed in solemn discourse, and *you* in common language. *Ye* (plural) is also used in serious addresses, and *you* in familiar language.

The uses of the word *it* are various, and very perplexing to the uneducated. It is not only used to imply persons, but things, and even ideas, and therefore in speaking or writing, its assistance is constantly required. The perplexity respecting this word arises from the fact that in using it in the construction of a long sentence, sufficient care is not taken to insure that when *it* is employed it really points out or refers to the object intended. For instance, "It was raining when John set out in his cart to go to market, and he was delayed so long that it was over before he arrived." Now what is to be understood by this sentence? Was the rain over? or the market? Either or both might be inferred from the construction of the sentence, which, therefore, should be written thus:—"It was raining when John set out in his cart to go to market, and he was delayed so long that the market was over before he arrived."

Rule.—After writing a sentence always look through it, and see that wherever the word *it* is employed, it refers to or carries the mind back to the object which it is intended to point out.

The general distinction between *this* and *that* may be thus defined: *this* denotes an object present or near, in time or place; *that* something which is absent.

These refers, in the same manner, to present objects, while *those* refers to things that are remote.

Who changes, under certain conditions, into *whose* and *whom*; but *that* and *which* always remain the same, with the exception of the possessive case, as noted above.

That may be applied to nouns or subjects of all sorts; as, the *girl that* went to school, the *dog that* bit me, the *opinion that* he entertains.

The misuse of these pronouns gives rise to more errors in speaking and writing than any other cause.

When you wish to distinguish between two or more persons, say, "*Which* is the happy man?" not *who*—"*Which* of those ladies do you admire?"

Instead of "*Whom* do you think him to be?" say, "*Who* do you think him to be?"

Whom should I see?

To *whom* do you speak?

Who said so?

Who gave it to you?

Of *whom* did you procure them?

Who was he?

Who do men say that *I* am?

Self should never be added to *his, their, mine, or thine.*

Each is used to denote *every* individual of a number.

Every denotes *all* the individuals of a number.

Either and *or* denote an alternative: "I will take *either* road, at your pleasure," "I will take this *or* that."

Neither means *not either*; and *nor* means *not the other.*

Either is sometimes used for *each*—"Two thieves were crucified, on *either* side one."

"Let *each* esteem others as good as themselves," should be, "Let *each* esteem others as good as *himself*."

"There are bodies *each* of which *are* so small," should be, "each of which *is* so small."

Do not use double superlatives, such as *most straightest, most highest, most finest.*

The term *worser* has gone out of use; but *lesser* is still retained.

The use of such words as *chiefest*, *extremest*, etc., has become obsolete, because they do not give any superior force to the meanings of the primary words, *chief*, *extreme*, etc.

Such expressions as *more impossible*, *more indispensable*, *more universal*, *more uncontrolable*, *more unlimited*, etc., are objectionable, as they really enfeeble the meaning which it is the object of the speaker or writer to strengthen. For instance, *impossible* gains no strength by rendering it *more* impossible. This class of error is common with persons who say, "A *great large* house," "A *great big* animal," "A *little small* foot," "A *tiny little* hand."

Here, *there* and *where*, originally denoting place, may now, by common consent, be used to denote other meanings; such as, "*There* I agree with you," "*Where* we differ," "We find pain *where* we expected pleasure," "*Here* you mistake me."

Hence, *whence* and *thence*, denoting departure, etc., may be used without the word *from*. The idea of *from* is included in the word *whence*—therefore it is unnecessary to say "*From whence*."

Hither, *thither*, and *whither*, denoting to a place, have generally been superseded by *here*, *there*, and *where*. But there is no good reason why they should not be employed. If, however, they are used, it is unnecessary to add the word *to*, because that is implied—"*Whither* are you going?" "*Where* are you going?" Each of these sentences is complete. To say, "Where are you going *to*?" is redundant.

Two *negatives* destroy each other, and produce an affirmative. "*Nor* did he *not* observe them," conveys the idea that he *did* observe them.

But negative assertions are allowable. "His manners are not impolite," which implies that his manners are in some degree marked by politeness.

Instead of "Let you and *I*," say "Let you and me."

Instead of "I am not so tall as *him*," say "I am not so tall as he."

When asked "Who is there?" do not answer "*Me*," but "I."

Instead of "For you and *I*," say "For you and me."

Instead of "*Says I*," say, "I said."

Instead of "You are taller than *me*," say "You are taller than I."

Instead of "I *ain't*," or "I *arn't*," say "I am not."

Instead of "Whether I be present or no, say "Whether I be present or not."

For "Not that I know on, say "Not that I know."

Instead of "*Was* I to do so," say "Were I to do so."

Instead of "I would do the same if I *was him*," say "I would do the same if I were he."

Instead of "I *had as lief* go myself," say "I would as soon go myself," or "I would rather."

It is better to say "Six weeks ago," than "Six weeks back."

It is better to say "Since which time," than "Since when."

It is better to say "I repeated it," than "I said so over again."

Instead of "He was too young to *have* suffered much," say "He was too young to suffer much."

Instead of "*Less* friends," say "Fewer friends." Less refers to quantity.

Instead of "A *quantity* of people," say "A number of people."

Instead of "*He and they* we know," say "Him and them."

Instead of "*As* far as I can see," say "So far as I can see."

Instead of "A *new pair* of gloves, say "A pair of new gloves."

Instead of "I hope you'll think nothing *on* it," say "I hope you'll think nothing of it."

Instead of "Restore it *back* to me," say "Restore it to me."

Instead of "I suspect the *veracity* of his story," say "I doubt the truth of his story."

Instead of "I seldom *or ever* see him," say "I seldom see him."

Instead of "I expected *to have* found him," say "I expected to find him."

Instead of "Who *learns* you music?" say "Who teaches you music?"

Instead of "I *never* sing *whenever* I can help it," say "I never sing when I can help it."

Instead of "Before I do that I must *first* ask leave," say "Before I do that I must ask leave."

Instead of saying "The *observation* of the rule," say "The observance of the rule."

Instead of "A man *of* eighty years of age," say "A man eighty years old."

Instead of "Here *lays* his honored head," say "Here lies his honored head."

Instead of "He died from *negligence*," say "He died through neglect," or "in consequence of neglect."

Instead of "Apples are plenty," say "Apples are plentiful."

Instead of "The *latter end* of the year," say "The end, or the close, of the year."

Instead of "The *then* government," say "The government of that age, or century, or year, or time."

Instead of "A *couple* of chairs," say "Two chairs."

Instead of "They are *united together* in the bonds of matrimony," say "They are united in matrimony," or "They are married."

Instead of "We travel *slow*," say "We travel slowly."

Instead of "He plunged *down* into the river," say "He plunged into the river."

Instead of "He jumped *from off of* the scaffolding," say "He jumped off the scaffolding."

Instead of "He came the last *of all*," say "He came the last."

Instead of "*universal*," with reference to things that have any limit, say "general;" "generally approved," instead of "universally approved;" "generally beloved," instead of "universally beloved."

Instead of "They ruined *one another*," say "They ruined each other."

Instead of "If *in case* I succeed," say "If I succeed."

Instead of "A *large enough* room," say "A room large enough."

Instead of "I am slight in comparison *to* you," say "I am slight in comparison with you."

Instead of "I went *for* to see him," say "I went to see him."

Instead of "The cake is all *eat up*," say "The cake is all eaten"

Instead of "Handsome is *as* handsome does," say "Handsome is who handsome does."

Instead of "The book fell *on* the floor," say "The book fell to the floor."

Instead of "His opinions are *approved of* by all," say "His opinions are approved by all."

Instead of "I will add *one more* argument," say "I will add one argument more," or "another argument."

Instead of "A sad curse is war," say "War is a sad curse."

Instead of "He stands *six foot* high," say "He measures six feet," or "His height is six feet."

Instead of "I go *every now and then*," say "I go sometimes (or often)."

Instead of "Who finds him in clothes," say "Who provides him with clothes."

Say "The first two," and the last two," instead of "the *two first*," "the two last."

Instead of "His health was *drank with enthusiasm*," say "His health was drunk enthusiastically."

Instead of "*Except* I am prevented," say "Unless I am prevented."

Instead of "In its *primary sense*," say "In its primitive sense."

Instead of "It grieves me to *see* you," say "I am grieved to see you."

Instead of "Give me *them* papers," say "Give me those papers."

Instead of "*Those* papers I hold in my hand," say "These papers I hold in my hand."

Instead of "I could scarcely imagine but *what*," say "I could scarcely imagine but that."

Instead of "He was a man *notorious* for his benevolence," say "He was noted for his benevolence."

Instead of "She was a woman *celebrated* for her crimes," say "She was notorious on account of her crimes."

Instead of "What may your name be?" say "What is your name?"

Instead of "I lifted it *up*," say "I lifted it."

Instead of "It is *equally of the same* value," say "It is of the same value," or "equal value."

Instead of "I knew it *previous* to your telling me," say "I knew it previously to your telling me."

Instead of "You *was* out when I called," say "You were out when I called."

Instead of "I thought I should *have won* this game," say "I thought I should win this game."

Instead of "*This* much is certain," say "Thus much is certain," or, "So much is certain."

Instead of "He went away *as it may be* yesterday week," say "He went away yesterday week."

Instead of "He came *the Saturday as it may be before the Monday*," specify the Monday on which he came.

Instead of "Put your watch *in* your pocket," say "Put your watch into your pocket"

Instead of "He has *got* riches," say "He has riches."

Instead of "Will you *set* down?" say "Will you sit down?"

Instead of "No *thankee*," say "No, thank you."

Instead of "I cannot do it without *farther* means," say "I cannot do it without further means."

Instead of "No sooner *but*," or "No other *but*," say "than."

Instead of "*Nobody else* but her," say "Nobody but her."

Instead of "He fell *down* from the balloon," say "He fell from the balloon."

Instead of "He rose *up* from the ground," say "He rose from the ground."

Instead of "*These* kind of oranges *are* not good," say "This kind of oranges is not good."

Instead of "Somehow or *another*," say "Somehow or other."

Instead of "*Will* I give you some more tea?" say "Shall I give you some more tea?"

Instead of "Oh dear, what *will* I do?" say "Oh dear, what shall I do?"

Instead of "I think *indifferent* of it," say "I think indifferently of it."

Instead of "I will send it *conformable* to your orders," say "I will send it conformably to your orders."

Instead of "To be *given away gratis*," say "To be given away."

Instead of "Will you enter in?" say "Will you enter?"

Instead of "*This* three days or more," say "These three days or more."

Instead of "He is a bad *grammarian*," say "He is not a grammarian."

Instead of "We *accuse him for*," say "We accuse him of."

Instead of "We *acquit* him *from*," say "We acquit him of."

Instead of "I am averse *from* that," say "I am averse to that."

Instead of "I confide *on* you," say "I confide in you."

Instead of "As soon *as ever*," say "As soon as."

Instead of "The *very best*," or "The *very worst*," say "The best or the worst."

Avoid such phrases as "No great shakes," "Nothing to boast of," "Down in my boots," "Suffering from the blues." All such sentences indicate vulgarity.

Instead of "No one *hasn't* called," say "No one has called."

Instead of "You have a *right* to pay me," say "It is right that you should pay me."

Instead of "I am going *over* the bridge," say "I am going *across* the bridge."

Instead of "I *should just* think I could," say "I think I can."

Instead of "There has been a *good deal*," say "There has been much."

Instead of saying "The effort you are making *for* meeting the bill," say "The effort you are making to meet the bill."

To say "Do *not* give him *no more* of your money," is equivalent to saying "Give him some of your money." Say "Do not give him *any* of your money."

Instead of saying "They are not what nature *designed* them," say "They are are not what nature designed them to be."

Instead of saying "I had not the pleasure of hearing his sentiments when I wrote that letter," say "I had not the pleasure of having heard," etc.

Instead of "The quality of the apples *were* good," say "The quality of the apples was good."

Instead of "The want of learning, courage and energy *are* more visible," say, "Is more visible."

Instead of "We die *for* want," say "We die of want."

Instead of "He died *by* fever," say "He died of fever."

Instead of "I *enjoy* bad health," say "My health is not good."
Instead of "*Either* of the three," say "Any one of the three."
Instead of "Better *nor* that," say "Better than that."
Instead of "We often think *on* you," say "We often think of you."
Instead of "Mine is *so* good as yours," say "Mine is as good as yours."
Instead of "This town is not *as* large as we thought," say "This town is not so large as we thought."
Instead of "*Because* why?" say "Why?"
Instead of "That *there* boy," say "That boy."
Instead of "That horse is not *much worth*," say "The horse is not worth much."
Instead of "The *subject-matter* of debate," say "The subject of debate."
Instead of saying "When he *was* come back," say "When he had come back."
Instead of saying "His health has been *shook*," say "His health has been shaken."
Instead of "It was *spoke* in my presence," say "It was spoken in my presence."
Instead of "*Very* right," or "*Very* wrong," say "Right," or "Wrong."
Instead of "The *mortgageor* paid him the money," say "The mortgagee paid him the money," The mortgagee lends; the mortgageor borrows.
Instead of "I *took you to be* another person," say "I mistook you for another person."
Instead of "On *either* side of the river," say "On each side of the river."
Instead of "*There's* fifty," say "There are fifty."
Instead of "The *best* of the two," say "The better of the two."
Instead of "My clothes have *become too small* for me," say "I have grown too stout for my clothes."
Instead of "Two *spoonsful* of physic," say "Two spoonfuls of physic."
Instead of "She said, says she," say "She said."
Avoid such phrases as "I said, says I," "Thinks I to myself," etc.
Instead of "I don't think so," say "I think not."
Instead of "He was in *eminent* danger," say "He was in *imminent* danger."
Instead of "The weather is *hot*," say "The weather is very warm."
Instead of "I *sweat*," say "I perspire."
Instead of "I *only* want two dollars," say "I want only two dollars."
Instead of "Whatsomever," say "Whatever," or "Whatsoever."
Avoid such exclamations as "God bless me!" "God deliver me!" "By God!" "By Gosh!" "My Lord!" "Upon my soul," etc., which are vulgar on the one hand, and savor of impiety on the other, for—"Thou shalt not take the name of the Lord thy God in vain."

PRONUNCIATION.

Accent is a particular stress or force of the voice upon certain syllables or words. This mark ' in printing denotes the syllable upon which the stress or force of the voice should be placed.

A word may have more than one accent. Take as an instance *aspiration*. In uttering this word we give a marked emphasis of the voice upon the first and third syllables, and therefore those syllables are said to be accented. The first of these accents is less distinguishable than the second, upon which we dwell longer, therefore the second accent in point of order is called the primary, or chief accent of the word.

When the full accent falls on a vowel, that vowel should have a long sound, as in *vo'cal*; but when it falls on or after a consonant, the preceding vowel has a short sound, as in *hab'it*.

To obtain a good knowledge of pronunciation, it is advisable for the reader to listen to the examples given by good speakers, and by educated persons. We learn the pronunciation of words, to a great extent, by *imitation*, just as birds acquire the notes of other birds which may be near them.

But it will be very important to bear in mind that there are many words having a double meaning or application, and that the difference of meaning is indicated by the difference of the accent. Among these words, *nouns* are distinguished from

verbs by this means: *nouns* are mostly accented on the first syllable, and *verbs* on the last.

Noun signifies name; *nouns* are the names of persons and things, as well as of things not material and palpable, but of which we have a conception and knowledge, such as *courage, firmness, goodness, strength;* and *verbs* express *actions, movements,* &c. If the word used signifies that anything has been done, or is being done, or is, or is to be done, then that word is a *verb.*

Thus when we say that anything is "an in'sult," that word is a *noun,* and is accented on the first syllable; but when we say he did it "to insult' another person," the word insult' implies *acting,* and becomes a *verb,* and should be accented on the last syllable.

A list of nearly all the words that are liable to similar variation is given here. It will be noticed that those in the first column, having the accent on the first syllable, are mostly nouns; and that those in the second column, which have the accent on the second and final syllable, are mostly verbs:—

Noun, &c.	*Verb, &c.*	*Noun, &c.*	*Verb, &c.*	*Noun, &c.*	*Verb, &c.*
Ab'ject	abject'	Con'trast	contrast'	In'lay	inlay'
Ab'sent	absent'	Con'verse	converse'	In'sult	insult'
Ab'stract	abstract'	Con'vert	convert'	Ob'ject	object'
Ac'cent	accent'	Con'vict	convict'	Out'leap	outleap'
Af'fix	affix'	Con'voy	convoy'	Per'fect	perfect'
As'pect	aspect'	De'crease	decrease'	Per'fume	perfume'
At'tribute	attrib'ute	Des'cant	descant'	Per'mit	permit'
Aug'ment	augment'	Des'ert	desert'	Pre'fix	prefix'
Au'gust	august'	De'tail	detail'	Prem'ise	premise'
Bom'bard	bombard'	Di'gest	digest'	Pres'age	presage'
Col'league	colleague'	Dis'cord	discord'	Pres'ent	present'
Col'lect	collect'	Dis'count	discount'	Prod'uce	produce'
Com'ment	comment'	Ef'flux	efflux'	Proj'ect	project'
Com'pact	compact'	Es'cort	escort'	Pro'test	protest'
Com'plot	complot'	Es'say	essay'	Reb'el	rebel'
Com'port	comport'	Ex'ile	exile'	Rec'ord	record'
Com'pound	compound'	Ex'port	export'	Ref'use	refuse'
Com'press	compress'	Ex'tract	extract'	Re'tail	retail'
Con'cert	concert'	Fer'ment	ferment'	Sub'ject	subject'
Con'crete	concrete'	Fore'cast	forecast'	Su'pine	supine'
Con'duct	conduct'	Fore'taste	foretaste'	Sur'vey	survey'
Con'fine	confine'	Fre'quent	frequent'	Tor'ment	torment'
Con'flict	conflict'	Im'part	impart'	Traj'ect	traject'
Con'serve	conserve'	Im'port	import'	Trans'fer	transfer'
Con'sort	consort'	Im'press	impress'	Trans'port	transport'
Con'test	contest'	Im'print	imprint'	Un'dress	undress'
Con'text	context'	In'cense	incense'	Up'cast	upcast'
Con'tract	contract'	In'crease	increase'	Up'start	upstart'

Cement' is an exception to the above rule, and should always be accented on the last syllable. So also the word consols'.

RULES OF PRONUNCIATION.

C before *a, o,* and *u,* and in some other situations, is a close articulation, like *k.* Before *e, i,* and *y, c* is precisely equivalent to *s* in *same, this*; as in *cedar, civil, cypress, capacity.*

E final indicates that the preceding vowel is long; as in hate, mete, sire, robe, lyre, abate, recede, invite, remote, intrude.

E final indicates that *c* preceding has the sound of *s;* as in *lace, lance;* and that *g* preceding has the sound of *j,* as in *charge, page, challenge.*

E final in proper English words, never forms a syllable, and in the most used words, in the terminating unaccented syllable it is silent. Thus, *motive, genuine, examine, granite,* are pronounced *motiv, genuin, examin, granit.*

E final, in a few words of foreign origin, forms a syllable; as *syncope, simile.*

E final is silent after *l* in the following terminations,—*ble, cle, dle, fle, gle, kle, ple, tle, zle ;* as in *able, manacle, cradle, ruffle, mangle, wrinkle, supple, rattle, puzzle,* which are pronounced *ab'l, mana'cl, cra'dl, ruf'fl, man'gl, wrin'kl, sup'pl, puz'zl.*

E is usually silent in the termination *en ;* as in *token, broken ;* pronounced *tokn, brokn.*

OUS, in the termination of adjectives and their derivatives, is pronounced *us ;* as in *gracious, pious, pompously.*

CE, CI, TI, before a vowel, have the sound of *sh ;* as in *cetaceous, gracious, motion, partial, ingratiate ;* pronounced *cetashus, grashus, moshun, parshal, ingrashiate.*

SI, after an accented vowel, is pronounced like *zh ;* as in *Ephesian, confusion ;* pronounced *Ephezhan, confuzhon.*

GH, both in the middle and at the end of words is silent; as in *caught, bought, fright, nigh, sigh ;* pronounced *caut, baut, frite, ni, si.* In the following exceptions, however, *gh* are pronounced as *f :—cough, chough, clough, enough, laugh, rough, slough, tough, trough.*

When WH begins a word, the aspirate *h* precedes *w* in pronunciation: as in *what, whiff, whale ;* pronounced *hwat, hwiff, hwale, w* having precisely the sound of *oo,* French *ou.* In the following words *w* is silent :—*who, whom, whose, whoop, whole.*

H after *r* has no sound or use ; as in *rheum, rhyme ;* pronounced *reum, ryme.*

H should be sounded in the middle of words ; as in fore*h*ead, ab*h*or, behold, ex*h*aust, in*h*abit, un*h*orse.

H should always be sounded except in the following words :—heir, herb, honest, ponor, hour, humor, and humble, and all their derivatives,— such as humorously, herived from humor.

K and G are silent before *n* ; as *know, gnaw ;* pronounced *no, naw.*

W before *r* is silent ; as in *wring, wreath ;* pronounced *ring, reath.*

B after *m* is silent ; as in *dumb, numb ;* pronounced *dum, num.*

L before *k* is silent as in *balk, walk, talk ;* pronounced *bauk, wauk, tauk.*

PH has the sound of *f :* as in *philosophy ;* pronounced *filosofy.*

NG has two sounds, one as in *singer,* the other as in *fin-ger.*

N after *m,* and closing a syllable, is silent ; as in *hymn, condemn.*

P before *s* and *t* is mute ; as in *psalm, pseudo, ptarmigan ;* pronounced *sarm, sudo, tarmigan.*

R has two sounds, one strong and vibrating, as at the beginning of words and syllables, such as *robber, reckon, error ;* the other is at the terminations of the words, or when succeeded by a consonant, as *farmer, morn.*

There are other rules of pronunciation affecting the combinations of vowels, etc. ; but as they are more difficult to describe, and as they do not relate to errors which are commonly prevalent, it will suffice to give examples of them in the following list of words. When a syllable in any word in this list is printed in italics, accent or stress of voice should be laid on that syllable.

WORDS OFTEN MISPRONOUNCED.

Again, usually pronounced a-*gen*, not as spelled.
Alien, *ale-yen*, not a-li-en.
Antipodes, an-*tip*-o-dees.
Apostle, as *a-pos'l*, without the *t*.
Arch, *artch* in compounds of our own language, as in archbishop, archduke ; but *ark* in words derived from the Greek, as archaic, ar-*ka*-ik ; archæology, ar-ke-*ol*-o-gy ; archangel, ark-*ain*-gel ; archetype, *ar*-ke-type ; archiepiscopal, ar-ke-e-*pis*-co-pal ; archipelago, ar-ke-*pel*-a-go ; ar-chives, *ar*-kivz, etc
Asia, *a*-shia.
Asparagus as spe'led, not asparagrass.
Aunt, ant, not awnt.
Awkward, awk-*wurd*, not awk-*urd*.
Bade, bad.
Because, be-*cauz*, not be-*cos*.
Been, bin.
Beloved, as a verb, be-*luvd* ; as an adjective, be-*luv*-ed. Blessed, cursed,

etc., are subject to the same rule.
Beneath, with the *th* in breath, not with the *th* in breathe.
Biog'raphy, as spelled, not beography.
Caprice, capreece.
Catch, as spelled, not ketch.
Chaos, *ka*-oss.
Charlatan, *shar*-latan.
Chasm, kazm.
Chasten, chasn.
Chivalry, *shiv*-alry.
Chemistry, *kem'-is-try.*
Choir, kwire.
Combat, *kom*-bat.
Conduit, *kun*-dit.
Corps, kor: the plural corps is pronounced korz.
Covetous, *cuv*-e-tus, not cuv-e-chus.
Courteous *curt*-yus.
Courtesy (politeness), *cur*-te-sey.
Courtesy (a lowering of the body), *curt*-sey.
Cresses, as spelled, not cr*ee*-ses.
Cu'riosity, cu-re-*os*-e-ty, not cur*os*ity.
Cushion, *coosh*-un, not coosh-*in*.
Daunt, d*aw*nt, not dant or darnt.
Design and desist have the sound of *s*, not of *z*.
Desire should have the sound of *z*.
Dew, due, not doo.
Diamond, as spelled, not *di*-mond.
Diploma, de-*plo*-ma, not *dip*-lo-ma.
Diplomacy, de-*plo*-ma-cy, not *dip*-lo-ma-cy.
Divers (several), *di*-verz; but diverse (different), *di*-verse.
Drought, drowt, not drawt.
Duke, as spelled, not dook.
Dynasty, *dy*-nas-ty, not *dyn*-as-te.
Edict, *e*-dickt, not *ed*-ickt.
E'en, and e'er, een and air.
Egotism, *e*-go-tism, not *eg*-o-tism.
Either, *e*-ther.
Engine, *en*-jin, not *in*-jin.
Epistle, without the *t*.
Epitome, e-*pit*-o-me.
Epoch, *ep*-ock, not *e*-pock.
Equinox, *e*-qui-nox, not *eq*-kwe-nox.
Europe, *U*-rup, not *U*-rope.
Euro-*pe*-an, not Eu-*ro*-pean.
Every, *ev*-er-y, not *ev*-ry.
Executor, egz-*ec*-utor, not with the sound of *x*.
Extraordinary, ex-*tror*-di-ner-i, not *ex*-traordinary, nor extrornary.
February, as spelled, not Febuary.
Finance, fe-*nance*, not *fi*nance.
Foundling, as spelled, not *fond*-ling.
Garden, *gar*-dn, not gar-den, nor gard-ing.
Gauntlet, gawnt-let, not *gant*-let.
Geography, as spelled, not *jog*raphy, or gehography.
Geometry, as spelled, not *jom*-etry.
Haunt, hawnt, not hant.
Height, hite, not highth.
Heinous, *hay*-nus, not *hee*-nus.
Horizon, ho-*ri-zn*, not *hor*-i-zon.
Hymeneal, hy-men-*e*-al, not hy-menal.
Instead, in-*sted*, not instid.
Isolate, *i*-so-late, not *iz*-olate, nor *is*-olate.
Jalap, *jal*-ap, not jolup.
January, as spelled, not Jenuary nor Janewary.
Leave, as spelled, not leaf.
Legend, *lej*-end, or *le*-gend.
Many, *men*-ney, not man-ny.
Marchioness, *mar*-shun-ess, not as spelled.
Massacre, *mas*-sa-ker.
Mattress, as spelled, not *mat*-trass.
Matron, *ma*-trun, not mat-ron.
Medicine, *med*-e-cin, not *med*-cin.
Minute (sixty seconds), *min*-it.
Minute (small), mi-*nute*.
Mischievous, *mis*-chiv-us, not mis-*cheev*-us.
Ne'er, for never, nare.
New, nu, not noo.
Oblige, as spelled, not obleege.
Oblique, ob-*leek*, or o-*blike*.
Odorous, *o*-der-us, not *od*-ur-us.
Of, ov, except when compounded with there, here and where, which should be pronounced here-*of*, there-*of*, and where-*of*.
Off, as spelt, not awf.
Organization, *or*-gan-i-*za*-shun.
Ostrich, *os*-trich, not *os*-tridge.
Pageant, *paj*-ent, not *pa*-jant.
Parent, *pare*-ent, not *par*-ent.
Partisan, *par*-te-zan, not par-te-*zan*, nor *par*-ti-zan.
Physiognomy, as *fiz*-i-*og*-nomy, not physi-onnomy.
Pincers, *pin*-cerz. not pinch-erz.
Plaintiff, as spelled, not plantiff.
Precedent (an example), *pres*-e-dent; pre-*ce*-dent (going before in point of time, previous, former) is the pronunciation of the adjective.
Prologue, *pro*-log, not *prol*-og.
Radish, as spelled, not red-ish.
Raillery, *rail'*-er-y, or *ral*-er-y, not as spelled.
Rather, *ra*-ther, not ray-ther.
Resort, re-*zort*.
Resound, re-*zound*.
Respite, *res*-pit, not as spelled.
Rout (a party; and to rout) should be pronounced rowt. Route (a road), root or rowt.

Saunter, *sawn*-ter, not *sarn*-ter or *san*-ter.
Sausage, *saw*-sage, not *sos*-sidge, *sas*-sage.
Schedule, *shed*-ule, not shed-ule.
Seamstress is pronounced *seem*-stress, but semp-stress, as the word is sometimes spelt, in pronounced *sem*-stress.
Shire, as spelled, when uttered as a single word, but shortened into shir in composition.
Shone, shon, not shun, nor as spelled.
Soldier, *sole*-jer.
Solecism, *sol*-e-cizm, not *so*-le-cizm.
Soot, as spelled, not sut.
Sovereign, *sov*-er-in, or suv-er-in.
Specious, *spe*-shus, not *spesh*-us.
Stomacher, *stum*-a-cher.
Stone (weight), as spelled, not stun.
Synod, *sin*-od, not *sy*-nod.
Tenure, *ten*-ure, not *te*-nure.
Tenet, *ten*-et, not *te*-net.
Than, as spelled, not thun.
Tremor, *trem*-ur, not *tre*-mor.
Twelfth should have the th sounded.
Umbrella, as spelled, not um-ber-el-la.
Vase, vaiz or vahz, not vawze.
Was, woz, not wuz.
Weary, *weer*-i, not wary.
Were, wer, not ware.
Wrath, rawth, not rath: as an adjective it is spelled wroth, and pronounced with the vowel sound shorter, as in wrathful, etc.
Yacht, yot, not yat.
Zenith, *zen*-ith, not *ze*-nith.
Zodiac, zo-de-ak.
Zoology should have both *o*'s sounded, as *zo-ol*-o-gy, not *zoo*-lo-gy.

Note.—The tendency of all good elocutionists is to pronounce as nearly in accordance with the spelling as possible.

Pronounce—

—ace, not iss, as furn*ace*, not furn*iss*.
—age, not idge, as cabbage, courage, postage, village.
—ain, ane, not in, as certain, cert*ane*, not cert*in*.
—ate, not it, as moder*ate*, not moder*it*.
—ect, not ec, as asp*ect*, not asp*ec*; subj*ect*, not subj*ec*.
—ed, not id, or ud, as wicked, not wick*id*, or wick*ud*.
—el, not l, *mod*el, not *mod*'l; *nov*el, not *nov*'l.
—en, not n, as sudd*en*, not sudd*n*.—Burden, burthen, garden, lengthen, seven, strengthen, often, and a few others, have the *e* silent.
—ence, not unce, as influ*ence*, not influ-*unce*.
—es, not is, as pleas*es*, not pleas*is*.
—ile should be pronounced il, as fert*il*, not fert*ile*, in all words except chamomile (*cam*), exile, gentile, infantile, reconcile, and senile, which should be pronounced ile.
—in, not in, as Lat*in*, not Lat*n*.
—nd, not n, as husba*nd*, not husba*n*; thousa*nd*, not thousa*n*.
—ness, not niss, as careful*ness*, not carefulniss.
—ng, not n, as sing*ing*, not sing*in*; speak*ing*, not speak*in*.
—ngth, not nth, as stre*ng*th not stre*n*th.
—son, the *o* should be silent; as in treason, *tre-zn*, not *tre-son*.
—tal, not tle, as capi*tal*, not capi*tle*; metal, not met*tle*; mor*tal*, not mor*tle*; periodi*cal*, not periodi*cle*.
—xt, not x, as ne*xt*, not ne*x*.

WHAT'S IN A NAME?

An Englishman whose name was Wemyss
Went crazy at last, so it semyss,
  Because the people would not
  Understand that they ought
To call him not Weemis, but Weems.

Another whose last name was Knollys
Tried vainly to vote at the pollys;
  But no ballot he cast
  Because to the last
The clerk couldn't call Knolliss Noles.

And then a young butcher named Belvoir
Went and murdered a man with a clevoir
Because the man couldn't,
Or possibly wouldn't,
Pronounce his name properly Beever.

There was an athlete named Strachan
Who had plenty of sinew and braehan,
And he'd knock a man down
With an indignant frown
If he failed to pronounce his name Strawn.

SHORT RULES FOR SPELLING.

Words ending in **e** drop that letter on taking a suffix beginning with a vowel. Exceptions—words ending in **ge, ce,** or **oe.**

Final **e** of a primitive word is retained on taking a suffix beginning with a consonant. Exceptions—words ending in **dge,** and truly, duly, etc.

Final y of a primitive word, when preceded by a consonant, is generally changed into **i** on the addition of a suffix. Exceptions—retained before **ing** and **ish,** as pitying. Words ending in **ie** and dropping the **e** by Rule 1, change the **i** to **y,** as lying. Final **y** is sometimes changed to **e,** as duteous.

Nouns ending in **y,** preceded by a vowel, form their plural by adding **s;** as money, moneys. **Y** preceded by a consonant is changed to **ies** in the plural; as bounty, bounties.

Final **y** of a primitive word, preceded by a vowel, should not be changed into **i** before a suffix; as, joyless.

In words containing **ei** or **ie, ei** is used after the sound of **s;** as ceiling, seize, except in siege and a few words ending in cier. Inveigle, neither, leisure and weird also have **ei.** In other cases it is used, as in believe, achieve.

Words ending in **ceous** or **cious,** when relating to matter, end in **ceous;** all others in **cious.**

Words of one syllable, ending in a consonant, with a single vowel before it, double the consonants in derivatives; as, ship, shipping, etc. But if ending in a consonant with a double vowel before it, they do not double the consonant in derivatives; as troop, trooper, etc.

Words of more than one syllable, ending in a consonant preceded by a single vowel, and accented on the last syllable, double that consonant in derivatives; as commit, committed; but except chagrin, chagrined.

All words of one syllable ending in **l,** with a single vowel before it, have **ll** at the close; as mill, sell.

All words of one syllable ending in **l,** with a double vowel before it, have only one **l** at the close; as mail, sail.

The words foretell, distill, instill and fulfill, retain the double **ll** of their primitives. Derivatives of dull, skill, will and full also retain the double **ll** when the accent falls on these words; as dullness, skillful, willful, fullness.

PUNCTUATION.

A period (.) after every declarative and every imperative sentence; as, It is true Do right.

A period after every abbreviation; as, Dr., Mr., Capt.

An interrogation point (?) after every question.

The exclamation point (!) after exclamations; as, Alas! Oh, how lovely!

Quotation marks (" ") enclose quoted expressions; as, Socrates said: "I believe the soul is immortal."

A colon (:) is used between parts of a sentence that are subdivided by semicolons.

A colon is used before a quotation, enumeration, or observation, that is intro-

duced by *as follows*, *the following*, or any similar expression; as, Send me the following: 10 doz. "Armstrong's Treasury," 25 Schulte's Manual, etc.

A semicolon (;) between parts that are subdivided by commas.

The semicolon is used also between clauses or members that are disconnected in sense; as, Man grows old; he passes away; all is uncertain. When **as, namely, that is,** is used to introduce an example or enumeration, a semicolon is put before it and a comma after it; as, The night was cold; that is, for the time of year.

A comma (,) is used to set off co-ordinate clauses, and subordinate clauses not restrictive; as, Good deeds are never lost, though sometimes forgotten.

A comma is used to set off transposed phrases and clauses; as, "When the wicked entice thee, consent thou not."

A comma is used to set off interposed words, phrases and clauses; as, Let us, if we can, make others happy.

A comma is used between similar or repeated words or phrases; as, The sky, the water, the trees, were illumined with sunlight.

A comma is used to mark an ellipsis, or the omission of a verb or other important word.

A comma is used to set off a short quotation informally introduced; as, Who said, "The good die young"?

A comma is used whenever necessary to prevent ambiguity.

The marks of parenthesis ( ) are used to enclose an interpolation where such interpolation is by the writer or speaker of the sentence in which it occurs. Interpolations by an editor or by anyone other than the author of the sentence should be inclosed in brackets, [ ].

Dashes (—) may be used to set off a parenthetical expression, also to denote an interruption or a sudden change of thought or a significant pause.

THE USE OF CAPITALS.

1. Every entire sentence should begin with a capital.
2. Proper names, and adjectives derived from these, should begin with a capital.
3. All appellations of the Deity should begin with a capital.
4. Official and honorary titles begin with a capital.
5. Every line of poetry should begin with a capital.
6. Titles of books and the heads of their chapters and divisions are printed in capitals.
7. The pronoun I, and the exclamation, O, are always capitals.
8. The days of the week, and the months of the year, begin with capitals.
9. Every quotation should begin with a capital letter.
10. Names of religious denominations begin with capitals.
11. In preparing accounts, each item should begin with a capital.
12. Any word of special importance may begin with a capital.

HOW TO WRITE A LETTER.

A business letter should be written clearly, explicitly, and concisely.

Figures should be written out, except dates; sums of money should be both in writing and figures.

Copies should be kept of all business letters.

When you receive a letter containing money it should be immediately counted and the amount marked on the top margin.

Letters to a stranger about one's own personal affairs, requesting answer, should always inclose a stamp.

Short sentences are preferable to long ones.

Letters requiring an answer should have prompt attention.

Never write a letter while under excitement or when in an unpleasant humor.

Never write an anonymous letter.

Do not fill your letter with repetitions and apologies.

Avoid writing with a pencil. Use black ink. Blue or violet may be used, but black is better.

In acknowledging receipt of a letter always mention date.

Paper. Note, packet or letter size should be used. It is unbusiness-like and very poor taste to use foolscap or mere scraps.

Paging. If single sheets are used they should be carefully paged. Business letters should be written on but one side of the sheet.

Folding. A letter sheet should be folded from bottom upward. Bring lower edge near the top so as to make the length a trifle shorter than the envelope, then fold twice the other way. The folded sheet should be just slightly smaller than the envelope.

If note sheet, fold twice from bottom upward. If envelope is nearly square, single fold of note sheet is sufficient.

Envelopes, like the paper, should be white, and of corresponding size and quality. It is poor taste to use colored paper, or anything but black ink.

The postage stamp should be placed at the upper right hand corner.

Address. This should be so plainly written that no possible mistake could be made either in name or address. It is unnecessary to add the letters P. O. after the name of the place. When the letter reaches the town it is not likely to go to the court-house or jail. Letters of introduction should bear upon envelope the name and address of the person to whom sent, also the words in the lower left hand corner, "Introducing Mr. ——."

LUMINOUS PAINT.—This useful paint may, it is said, be made by the following simple method: Take oyster shells and clean them with warm water; put them into the fire for half an hour; at the end of that time take them out and let them cool. When quite cool pound them fine and take away any gray parts, as they are of no use. Put the powder in a crucible in alternate layers with flour and sulphur. Put on the lid and cement with sand made into a stiff paste with beer. When dry, put over the fire and bake for an hour. Wait until quite cold before opening the lid. The product ought to be white. You must separate all gray parts, as they are not luminous. Make a sifter in the following manner: Take a pot, put a piece of very fine muslin very loosely across it, tie around with a string, put the powder into the top, and rake about until only the coarse powder remains; open the pot and you will find a very small powder; mix it into a thin paint with gum water, as two thin applications are better than one thick one. This will give a paint that will remain luminous far into the night, provided it is exposed to light during the day.

TRANSFERRING ENGRAVINGS.—It is said that engravings may be transferred on white paper as follows: Place the engraving a few seconds over the vapor of iodine. Dip a slip of white paper in a weak solution of starch, and when dry, in a weak solution of oil of vitriol. When again dry, lay a slip upon the engraving and place both for a few minutes under a press. The engraving will be reproduced in all its delicacy and finish. Lithographs and printed matter cannot be so transferred with equal success.

SYNONYMS AND ANTONYMS.

A Dictionary of 12,000 Words of Similar and Contrary Meaning.

NO TWO words in the English language have exactly the same significance, but to express the precise meaning which one intends to convey, and also to avoid repetitions, it is often desirable to have at hand a Dictionary of Synonyms. Take President Cleveland's famous phrase, "innocuous desuetude." If he had said simply, "harmless disuse," it would have sounded clumsy, whereas the words he used expressed the exact shade of meaning, besides giving the world a new phrase and the newspapers something to talk about.

The following list of SYNONYMS, while not exhaustive, is quite comprehensive, and by cross-reference will answer most requirements. The appended ANTONYMS, or words of opposite meaning, enclosed in parentheses, will also be found extremely valuable, for one of the strongest figures of speech is *antithesis*, or contrast :

ABANDON, leave, forsake, desert, renounce, relinquish, quit, forego, let go, waive. (Keep, cherish.) **Abandoned,** deserted, forsaken, wicked, reprobate, dissolute, profligate, flagitious, corrupt, depraved, vicious. (Cared for, virtuous.) **Abandonment,** leaving, desertion, dereliction, renunciation, defection. **Abasement,** degradation, fall, degeneracy, humiliation, abjection, debasement, servility. (Honor.) **Abash,** bewilder, disconcert, discompose, confound, confuse, shame. (Embolden.) **Abbreviate,** shorten, abridge, condense, contract, curtail, reduce. (Extend.) **Abdicate,** give up, resign, renounce, abandon, forsake, relinquish, quit, forego. **Abet,** help, encourage, instigate, incite, stimulate, aid, assist. (Resist.) **Abettor,** assistant, accessory, accomplice, promoter, instigator, *particeps criminis*, coadjutor, associate, companion, co-operator. (Opponent.) **Abhor,** dislike intensely, view with horror, hate, detest, abominate, loathe, nauseate. (Love.) **Ability,** capability, talent, faculty, capacity, qualification, aptitude, aptness, expertness, skill, efficiency, accomplishment, attainment. (Incompetency.) **Abject,** grovelling, low, mean, base, ignoble, worthless, despicable, vile, servile, contemptible. (Noble.) **Abjure,** recant, forswear, disclaim, recall, revoke, retract, renounce. (Maintain.) **Able,** strong, powerful, muscular, stalwart, vigorous, athletic, robust, brawny, skillful, adroit, competent, efficient, capable, clever, self-qualified, telling, fitted. (Weak.) **Abode,** residence, habitation, dwelling, domicile, home, quarters, lodging. **Abolish,** quash, destroy, revoke, abrogate, annul, cancel, annihilate, extinguish, vitiate, invalidate, nullify. (Establish, enforce.) **Abominable,** hateful, detestable, odious, vile, execrable. (Lovable.) **Abortive,** fruitless, ineffectual, idle, inoperative, vain, futile. (Effectual.) **About,** concerning, regarding, relative to, with regard to, as to, respecting, with respect to, referring to, around, nearly, approximately. **Abscond,** run off, steal away, decamp, bolt. **Absent,** *a.*, inattentive, abstracted, not attending to, listless, dreamy. (Present.) **Absolute,** entire, complete, unconditional unqualified, unrestricted, despotic, arbitrary, tyrannous, imperative, authoritative, imperious. (Limited.) **Absorb,** engross, swallow up, engulf, imbibe, consume, merge, fuse. **Absurd,** silly, foolish, preposterous, ridiculous, irrational, unreasonable, nonsensical, inconsistent. (Wise, solemn.) **Abuse,** *v.*, asperse, revile, vilify, reproach, calumniate, defame, slander, scandalize, malign, traduce, disparage, de-

preciate, ill-use. (Praise, protect.) **Abuse,** *n.*, scurrility, ribaldry, contumely, obloquy, opprobrium, foul, invective, vituperation, ill-usage. (Praise, protection.) **Accede,** assent to, consent, acquiesce, comply with, agree, coincide, concur, approve. (Protest.) **Accelerate,** hasten, hurry, expedite, forward, quicken, despatch. (Retard.) **Accept,** receive, take, admit. (Refuse.) **Acceptable,** agreeable, pleasing, pleasurable, gratifying, welcome. (Displeasing.) **Accident,** casualty, incident, contingency, adventure, chance. **Accommodate,** serve, oblige, adapt, adjust, fit, suit. (Disoblige, impede.) **Accomplice,** confederate, accessory, abettor, coadjutor, assistant, ally, associate, *particeps criminis*. (Adversary.) **Accomplish,** do, effect, finish, execute, achieve, complete, perfect, consummate. (Fail.) **Accomplishment,** attainment, qualification, acquirement. (Defect.) **Accord,** grant, allow, admit, concede. (Deny.) **Accost,** salute, address, speak to, stop, greet. **Account,** narrative, description, narration, relation, detail, recital, moneys, reckoning, bill, charge. **Accountable,** punishable, answerable, amenable, responsible, liable. **Accumulate,** bring together, amass, collect, gather. (Scatter, dissipate.) **Accumulation,** collection, store, mass, congeries, concentration. **Accurate,** correct, exact, precise, nice, truthful. (Erroneous, careless.) **Achieve,** do, accomplish, effect, fulfill, execute, gain, win. **Achievement,** feat, exploit, accomplishment, attainment, performance, acquirement, gain. (Failure.) **Acknowledge,** admit, confess, own, avow, grant, recognize, allow, concede. (Deny.) **Acquaint,** inform, enlighten, apprise, make aware, make known, notify, communicate. (Deceive.) **Acquaintance,** familiarity, intimacy, cognizance, fellowship, companionship, knowledge. (Unfamiliarity.) **Acquiesce,** agree, accede, assent, comply, consent, give way, coincide with. (Protest.) **Acquit,** pardon, forgive, discharge, set free, clear, absolve. (Condemn, convict.) **Act,** do, operate, make, perform, play, enact. **Action,** deed, achievement, feat, exploit, accomplishment, battle, engagement, agency, instrumentality. **Active,** lively, sprightly, alert, agile, nimble, brisk, quick, supple, prompt, vigilant, laborious, industrious. (Lazy, passive.) **Actual,** real, positive, genuine, certain. (Fictitious.) **Acute,** shrewd, intelligent, penetrating, piercing, keen. (Dull.) **Adapt,** accommodate, suit, fit, conform. **Addicted,** devoted, wedded, attached, given up to, dedicated. **Addition,** increase, accession, augmentation, reinforcement. (Subtraction, separation.) **Address,** speech, discourse, appeal, oration, tact, skill, ability, dexterity, deportment, demeanor. **Adhesion,** adherence, attachment, fidelity, devotion. (Aloofness.) **Adjacent,** near to, adjoining, contiguous, conterminous, bordering, neighboring. (Distant.) **Adjourn,** defer, prorogue, postpone, delay. **Adjunct,** appendage, appurtenance, appendency, dependency. **Adjust,** set right, fit, accommodate, adapt, arrange, settle, regulate, organize. (Confuse.) **Admirable,** striking surprising, wonderful, astonishing. (Detestable.) **Admit,** allow, permit, suffer, tolerate. (Deny.) **Advantageous,** beneficial. (Hurtful.) **Affection,** love. (Aversion.) **Affectionate,** fond, kind. (Harsh.) **Agreeable,** pleasant, pleasing, charming. (Disagreeable.) **Alternating,** intermittent. (Continual.) **Ambassador,** envoy, plenipotentiary, minister. **Amend,** improve, correct, better, mend. (Impair.) **Anger,** ire, wrath, indignation, resentment. (Good nature.) **Appropriate,** assume, ascribe, arrogate, usurp. **Argue,** debate, dispute, reason upon. **Arise,** flow, emanate, spring, proceed, rise, issue. **Artful,** disingenuous, sly, tricky, insincere. (Candid.) **Artifice,** trick, stratagem, finesse. **Association,** combination, company, partnership, society. **Attack,** assail, assault, encounter. (Defend.) **Audacity,** boldness, effrontery, hardihood. (Meekness.) **Austere,** rigid, rigorous, severe, stern. (Dissolute.) **Avaricious,** niggardly, miserly, parsimonious. (Generous.) **Aversion,** antipathy, dislike, hatred, repugnance. (Affection.) **Awe,** dread, fear, reverence. (Familiarity.) **Awkward,** clumsy. (Graceful.) **Axiom,** adage, aphorism, apothegm, by-word, maxim, proverb, saying, saw.

BABBLE, chatter, prattle, prate. **Bad,** wicked, evil. (Good.) **Baffle,** confound, defeat, disconcert. (Aid, abet.) **Base,** vile, mean. (Noble.) **Battle,** action, combat, engagement. **Bear,** carry, convey, transport. **Bear,** endure, suffer, support. **Beastly,** brutal, sensual, bestial. **Beat,** defeat, overpower, overthrow, rout. **Beautiful,** fine, handsome, pretty. (Homely, ugly.) **Becoming,** decent, fit, seemly, suitable. (Unbecoming.) **Beg,** beseech, crave, entreat, implore, solicit,

supplicate. (Give.) **Behavior,** carriage, conduct, deportment, demeanor. **Belief,** credit, faith, trust. (Doubt.) **Beneficient,** bountiful, generous, liberal, munificent. (Covetous, miserly.) **Benefit,** favor, advantage, kindness, civility. (Injury.) **Benevolence,** beneficence, benignity, humanity, kindness, tenderness. (Malevolence.) **Blame,** censure, condemn, reprove, reproach, upbraid. (Praise.) **Blemish,** flaw, speck, spot, stain. (Ornament.) **Blind,** sightless, heedless. (Far-sighted.) **Blot,** cancel, efface, expunge, erase, obliterate. **Bold,** brave, daring, fearless, intrepid, undaunted. (Timid.) **Border,** brim, brink, edge, margin, rim, verge, boundary, confine, frontier. **Bound,** circumscribe, confine, limit, restrict. **Brave,** dare, defy. **Bravery,** courage, valor. (Cowardice.) **Break,** bruise, crush, pound, squeeze. **Breeze,** blast, gale, gust, hurricane, storm, tempest. **Bright,** clear, radiant, shining. (Dull.) **Brittle. Burial,** interment, sepulture. (Resurrection.) **Business,** avocation, employment, engagement, occupation, art, profession, trade. **Bustle,** stir, tumult, fuss. (Quiet.)

CALAMITY, disaster, misfortune, mischance, mishap. (Good fortune.) **Calm,** collected, composed, placid, serene. (Stormy, unsettled.) **Capable,** able, competent. (Incompetent.) **Captious,** fretful, cross, peevish, petulant. (Good-natured.) **Care,** anxiety, concern, solicitude, heed, attention. (Heedlessness, negligence.) **Caress,** kiss, embrace. (Spurn, buffet.) **Carnage,** butchery massacre, slaughter. **Cause,** motive, reason. (Effect, consequence.) **Cease,** discontinue, leave off, end. (Continue.) **Censure,** animadvert, criticise. (Praise.) **Certain,** secure, sure. (Doubtful.) **Cessation,** intermission, rest, stop. (Continuance.) **Chance,** fate, fortune. (Design.) **Change,** barter, exchange, substitute. **Changeable,** fickle, inconstant, mutable, variable. (Unchangeable.) **Character,** reputation, repute, standing. **Charm,** captivate, enchant, enrapture, fascinate. **Chastity,** purity, continence, virtue. (Lewdness.) **Cheap,** inexpensive, inferior, common. (Dear.) **Cheerful,** gay, merry, sprightly. (Mournful.) **Chief,** chieftain, head, leader (Subordinate.) **Circumstance,** fact, incident. **Class,** degree, order, rank, **Clear,** bright, lucid, vivid. (Opaque.) **Clever,** adroit, dexterous, expert, skillful. (Stupid.) **Clothed,** clad, dressed. (Naked.) **Coarse,** rude, rough, unpolished. (Fine.) **Coax,** cajole, fawn, wheedle. **Cold,** cool, frigid, wintry, unfeeling, stoical. (Warm.) **Color,** dye, stain, tinge. **Colorable,** ostensible, plausible, specious. **Combination,** cabal, conspiracy, plot. **Command,** injunction, order, precept. **Commodity,** goods, merchandise, ware. **Common,** mean, ordinary, vulgar. (Uncommon, extraordinary.) **Compassion,** sympathy, pity, clemency. (Cruelty, severity.) **Compel,** force, oblige, necessitate. (Coax, lead.) **Compensation,** amends, recompense, remuneration, requital, reward. **Compendium,** compend, abridgment. (Enlargement.) **Complain,** lament, murmur, regret, repine. (Rejoice.) **Comply,** accede, conform, submit, yield. (Refuse.) **Compound,** complex. (Simple.) **Comprehend,** comprise, include, embrace, grasp, understand, perceive. (Exclude, mistake.) **Comprise,** comprehend, contain, embrace, include. **Conceal,** hide, secrete. (Uncover.) **Conceive,** comprehend, understand.. **Conclusion,** inference, deduction. **Condemn,** censure, blame, disapprove. (Justify, exonerate.) **Conduct,** direct, guide, lead, govern, regulate, manage. **Confirm,** corroborate, approve, attest. (Contradict.) **Conflict,** combat, contest, contention, struggle. (Peace, quiet.) **Confute,** disprove, refute, oppugn. (Approve.) **Conquer,** overcome, subdue, surmount, vanquish. (Defeat.) **Consequence,** effect, event, issue, result. (Cause.) **Consider,** reflect, ponder, weigh. **Consistent,** constant, compatible. (Inconsistent.) **Console,** comfort, solace. (Harrow, worry.) **Constancy,** firmness, stability, steadiness. (Fickleness.) **Contaminate,** corrupt, defile, pollute, taint. **Contemn,** despise, disdain, scorn. (Esteem.) **Contemplate,** meditate, muse. **Contemptible,** despicable, paltry, pitiful, vile, mean. (Noble.) **Contend,** contest, dispute, strive, struggle, combat. **Continual,** constant, continuous, perpetual, incessant. (Intermittent. **Continuance,** continuation, duration. (Cessation.) **Continue,** persist, persevere, pursue, prosecute. (Cease.) **Contradict,** deny, gainsay, oppose. (Confirm.) **Cool,** cold, frigid. (Hot.) **Correct,** rectify, reform. **Cost,** charge, expense, price. **Covetousness,** avarice, cupidity. (Beneficence.) **Cowardice, fear, timidity, pusillanimity.** (Courage.) **Crime,** sin, vice, misdemeanor. (Vir-

tue.) **Criminal,** convict, culprit, felon, malefactor. **Crooked,** bent, curved, oblique. (Straight.) **Cruel,** barbarous, brutal, inhuman, savage. (Kind.) **Cultivation,** culture, refinement. **Cursory,** desultory, hasty, slight. (Thorough.) **Custom,** fashion, manner, practice.

DANGER, hazard, peril. (Safety.) **Dark,** dismal, opaque, obscure, dim. (Light.) **Deadly,** fatal, destructive, mortal. **Dear,** beloved, precious, costly, expensive. (Despised, cheap.) **Death,** departure, decease, demise. (Life.) **Decay,** decline, consumption. (Growth.) **Deceive,** delude, impose upon, over-reach, gull, dupe, cheat. **Deceit,** cheat, imposition, trick, delusion, guile, beguilement, treachery, sham. (Truthfulness.) **Decide,** determine, settle, adjudicate, terminate, resolve. **Decipher,** read, spell, interpret, solve. **Decision,** determination, conclusion, resolution, firmness. (Vacillation.) **Declamation,** oratory, elocution, harangue, effusion, debate. **Declaration,** avowal, manifestation, statement, profession. **Decrease,** diminish, lessen, wane, decline, retrench, curtail, reduce. (Growth.) **Dedicate,** devote, consecrate, offer, set, apportion. **Deed,** act, action, commission, achievement, instrument, document, muniment. **Deem,** judge, estimate, consider, think, suppose, conceive. **Deep,** profound, subterranean, submerged, designing, abstruse, learned. (Shallow.) **Deface,** mar, spoil, injure, disfigure. (Beautify.) **Default,** lapse, forfeit, omission, absence, want, failure. **Defect,** imperfection, flaw, fault, blemish. (Beauty, improvement.) **Defend,** guard, protect, justify. **Defense,** excuse, plea, vindication, bulwark, rampart. **Defer,** delay, postpone, put off, prorogue, adjourn. (Force, expedite.) **Deficient,** short, wanting, inadequate, scanty, incomplete. (Complete, perfect.) **Defile,** *v.*, pollute, corrupt, sully. (Beautify.) **Define,** fix, settle, determine, limit. **Defray,** meet, liquidate, pay, discharge. **Degree,** grade, extent, measure. **Deliberate,** *v.*, consider, meditate, consult, ponder, debate. **Deliberate,** *a.*, purposed, intentional, designed, determined. (Hasty.) **Delicacy,** nicety, dainty, refinement, tact, softness, modesty. (Boorishness, indelicacy.) **Delicate,** tender, fragile, dainty, refined. (Coarse.) **Delicious,** sweet, palatable. (Nauseous.) **Delight,** enjoyment, pleasure, happiness, transport, ecstacy, gladness, rapture, bliss. (Annoyance.) **Deliver,** liberate, free, rescue, pronounce, give, hand over. (Retain.) **Demonstrate,** prove, show, exhibit, illustrate. **Depart,** leave, quit, decamp, retire, withdraw, vanish. (Remain.) **Deprive,** strip, bereave, despoil, rob, divest. **Depute,** appoint, commission, charge, intrust, delegate, authorize, accredit. **Derision,** scorn, contempt, contumely, disrespect. **Derivation,** origin, source, beginning, cause, etymology, root. **Describe,** delineate, portray, explain, illustrate, define, picture. **Desecrate,** profane, secularize, misuse, abuse, pollute. (Keep holy.) **Deserve,** merit, earn, justify, win. **Design,** *n.*, delineation, sketch, drawing, cunning, artfulness, contrivance. **Desirable,** expedient, advisable, valuable, acceptable, proper, judicious, beneficial, profitable, good. **Desire,** *n.*, longing, affection, craving. **Desist,** cease, stop, discontinue, drop, abstain, forbare. (Continue, persevere.) **Desolate,** bereaved, forlorn, forsaken, deserted, wild, waste, bare, bleak, lonely. (Pleasant, happy.) **Desperate,** wild, daring, audacious, determined, reckless. **Despised. Destiny,** fate, decree, doom, end. **Destructive,** detrimental, hurtful, noxious, injurious, deleterious, baleful, baneful, subversive. (Creative, constructive.) **Desuetude,** disuse, discontinuance. (Maintenance.) **Desultory,** rambling, discursive, loose, unmethodical, superficial, unsettled, erratic, fitful. (Thorough.) **Detail,** *n.*, particular, specification, minutiæ. **Detail,** *v.*, particularize, enumerate, specify. (Generalize.) **Deter,** warn, stop, dissuade, terrify, scare. (Encourage.) **Detriment,** loss, harm, injury, deterioration. (Benefit.) **Develop,** unfold, amplify, expand, enlarge. **Device,** artifice, expedient, contrivance. **Devoid,** void, wanting, destitute, unendowed, unprovided. (Full, complete.) **Devoted,** attached, fond, absorbed, dedicated. **Dictate,** prompt, suggest, enjoin, order, command. **Dictatorial,** imperative, imperious, domineering, arbitrary, tyrannical, overbearing. (Submissive.) **Die,** expire, depart, perish, decline, languish, wane, sick, fade, decay. **Diet,** food, victuals, nourishment, nutriment, sustenance, fare. **Difference,** separation, disagreement, discord, dissent, estrangement, variety. **Different,** various, manifold, diverse, unlike, separate, distinct. (Similar, homogeneous.) **Difficult,** hard, intricate, involved, perplexing, obscure, unmanageable. (Easy.) **Diffuse,** discursive, prolix,

diluted, copious. **Dignify**, aggrandize, elevate, invest, exalt, advance, promote, honor. (Degrade.) **Dilate**, stretch, widen, expand, swell, distend, enlarge, descant, expatiate. **Dilatory**, tardy, procrastinating, behindhand, lagging, dawdling. (Prompt.) **Diligence**, care, assiduity, attention, heed, industry. (Negligence.) **Diminish**, lessen, reduce, contract, curtail, retrench. (Increase.) **Disability**, unfitness, incapacity. **Discern**, descry, observe, recognize, see, discriminate, separate, perceive. **Discipline**, order, strictness, training, coercion, punishment, organization. (Confusion, demoralization. **Discover**, make known, find, invent, contrive, expose, reveal. **Discreditable**, shameful, disgraceful, scandalous; disreputable. (Creditable.) **Discreet**, cautious, prudent, wary, judicious. (Indiscreet.) **Discrepancy**, disagreement, difference, variance. (Agreement.) **Discrimination**, acuteness, discernment, judgment, caution. **Disease**, complaint, malady, disorder, ailment, sickness. **Disgrace**, *n.*, disrepute, reproach, dishonor, shame, odium. (Honor.) **Disgrace**, *v.*, debase, degrade, defame, discredit. (Exalt.) **Disgust**, dislike, distaste, loathing, abomination, abhorrence. (Admiration.) **Dishonest**, unjust, fraudulent, unfair, deceitful, cheating, deceptive, wrongful. (Honest.) **Dismay**, *v.*, terrify, frighten, scare, daunt, appall, dishearten. (Encourage.) **Dismay**, *n.*, terror, dread, fear, fright. (Assurance.) **Dismiss**, send off, discharge, discard, banish. (Retain.) **Dispel**, scatter, drive away, disperse, dissipate. (Collect.) **Display**, show, spread out, exhibit, expose. (Hide.) **Dispose**, arrange, place, order, give, bestow. **Dispute**, *v.*, argue, contest, contend, question, impugn. (Assent.) **Dispute**, *n.*, argument, debate, controversy, quarrel, disagreement. (Harmony.) **Dissent**, disagree, differ, vary. (Assent.) **Distinct**, clear, plain, obvious, different, separate. (Obscure, indistinct.) **Distinguish**, perceive, discern, mark out, divide, discriminate. **Distinguished**, famous, glorious, far-famed, noted, illustrious, eminent, celebrated. (Obscure, unknown, ordinary.) **Distract**, perplex, bewilder. (Calm, concentrate.) **Distribute**, allot, share, dispense, apportion, deal. (Collect.) **Disturb**, derange, discompose, agitate, rouse, interrupt, confuse, annoy, trouble, vex, worry. (Pacify, quiet.) **Disuse**, discontinuance, abolition, desuetude. (Use.) **Divide**, part, separate, distribute, deal out, sever, sunder. **Divine**, godlike, holy, heavenly, sacred, a parson, clergyman, minister. Do, effect, make, perform, accomplish, finished, transact. **Docil**, tractable, teachable, compliant, tame. (Stubborn.) **Doctrine**, tenet, articles of belief, creed, dogma, teaching. **Doleful**, dolorous, woe-begone, rueful, dismal, piteous. (Joyous.) **Doom**, *n.*, sentence, verdict, judgment, fate, lot, destiny. **Doubt**, *n.*, uncertainty, suspense, hesitation, scruple, ambiguity. (Certainty.) **Draw**, pull, haul, drag, attract, inhale, sketch, describe. **Dread**, *n.*, fear, horror, terror, alarm, dismay, awe. (Boldness, assurance.) **Dreadful**, fearful, frightful, shocking, awful, horrible, horrid, terrific. **Dress**, *n.*, clothing, attire, apparel, garments, costume, garb, livery. **Drift**, purpose, meaning, scope, aim, tendency, direction. **Droll**, funny, laughable, comic, whimsical, queer, amusing. (Solemn.) **Drown**, inundate, swamp, submerge, overwhelm, engulf. **Dry**, *a.*, arid, parched, lifeless, dull, tedious, uninteresting, meagre. (Moist interesting, succulent.) **Due**, owing to, attributable to, just, fair, proper, debt, ight. **Dull**, stupid, gloomy, sad, dismal, commonplace. (Bright.) **Dunce**, simpleton, fool, ninny, idiot. (Sage.) **Durable**, lasting, permanent, abiding, continuing. (Ephemeral, perishable.) **Dwell**, stay, stop, abide, sojourn, linger, tarry. **Dwindle**, pine, waste, diminish, decrease, fall off. (Grow.)

EAGER, hot, ardent, impassioned, forward, impatient. (Diffident.) **Earn**, acquire, obtain, win, gain, achieve. **Earnest**, *a.*, ardent, serious, grave, solemn, warm. (Trifling.) **Earnest**, *n.*, pledge, pawn. **Ease**, *n.*, comfort, rest. (Worry.) **Ease**, *v.*, calm, alleviate, allay, mitigate, appease, assuage, pacify, disburden, rid, (Annoy, worry.) **Easy**, light, comfortable, unconstrained. (Difficult, hard.) **Eccentric**, irregular, anomalous, singular, odd, abnormal, wayward, particular, strange. (Regular, ordinary.) **Economical**, sparing, saving, provident, thrifty, frugal, careful, niggardly. (Wasteful.) **Edge**, border, brink, rim, brim, margin, verge. **Efface**, blot out, expunge, obliterate, wipe out, cancel, erase. **Effect**, *n.*, consequence, result, issue, event, execution, operation. **Effect**, *v.*, accomplish, fulfill, realize, achieve, execute, operate, complete. **Effective**, efficient, operative, serviceable. (Vain, ineffectual.) **Efficacy**, efficiency, energy, agency, instrumen-

tality. **Efficient**, effectual, effective, competent, capable, able, fitted. **Eliminate**, drive out, expel, thrust out, eject, cast out, oust, dislodge, banish, proscribe. **Eloquence**, oratory, rhetoric, declamation. **Elucidate**, make plain, explain, clear up, illustrate. **Elude**, evade, escape, avoid, shun. **Embarrass**, perplex, entangle, distress, trouble. (Assist.) **Embellish**, adorn, decorate, bedeck, beautify, deck. (Disfigure.) **Embolden**, inspirit, animate, encourage, cheer, urge, impel, stimulate. (Discourage.) **Eminent**, distinguished, signal, conspicuous, noted, prominent, elevated, renowned, famous, glorious, illustrious. (Obscure, unknown.) **Emit**, give out, throw out, exhale, discharge, vent. **Emotion**, perturbation, agitation, trepidation, tremor, mental conflict. **Employ**, occupy, busy, take up with, engross. **Employment**, business, avocation, engagement, office, function, trade, profession, occupation, calling, vocation. **Encompass**, *v.*, encircle, surround, gird, beset. **Encounter**, attack, conflict, combat, assault, onset, engagement, battle, action. **Encourage**, countenance, sanction, support, foster, cherish, inspirit, embolden, animate, cheer, incite, urge, impel, stimulate. (Deter.) **End**, *n.*, aim, object, purpose, result, conclusion, upshot, close, expiration, termination, extremity, sequel. **Endeavor**, attempt, try, essay, strive, aim. **Endurance**, continuation, duration, fortitude, patience, resignation. **Endure**, *v.*, last, continue, support, bear, sustain, suffer, brook, submit to, undergo. (Perish.) **Enemy**, foe, antagonist, adversary, opponent. (Friend.) **Energetic**, industrious, effectual, efficacious, powerful, binding, stringent, forcible, nervous. (Lazy.) **Engage**, employ, busy, occupy, attract, invite, allure, entertain, engross, take up, enlist. **Engross**, absorb, take up, busy, occupy, engage, monopolize. **Engulf**, swallow up, absorb, imbibe, drown, submerge, bury, entomb, overwhelm. **Enjoin**, order, ordain, appoint, prescribe. **Enjoyment**, pleasure, gratification. (Grief, sorrow, sadness.) **Enlarge**, increase, extend, augment, broaden, swell. (Diminish.) **Enlighten**, illumine, illuminate, instruct, inform. (Befog, becloud.) **Enliven**, cheer, vivify, stir up, animate, inspire, exhilarate. (Sadden, quiet.) **Enmity**, animosity, hostility, ill-will, maliciousness. (Friendship.) **Enormous**, gigantic, colossal, huge, vast, immense, prodigious. (Insignificant.) **Enough**, sufficient, plenty, abundance. (Want.) **Enraged**, infuriated, raging, wrathful. (Pacified.) **Enrapture**, enchant, fascinate, charm, captivate, bewitch. (Repel.) **Enroll**, enlist, list, register, record. **Enterprise**, undertaking, endeavor, venture, energy. **Enthusiasm**, earnest, devotion, zeal, ardor. (Ennui, lukewarmness.) **Enthusiast**, fanatic, visionary. **Equal**, equable, even, like, alike, uniform. (Unequal.) **Eradicate**, root out, extirpate, exterminate. **Erroneous**, incorrect, inaccurate, inexact. (Exact.) **Error**, blunder, mistake. (Truth.) **Especially**, chiefly, particularly, principally. (Generally.) **Essay**, dissertation, tract, treatise. **Establish**, build up, confirm. (Overthrow.) **Esteem**, regard, respect. (Contempt.) **Estimate**, appraise, appreciate, esteem, compute, rate. **Estrangement**, abstraction, alienation. **Eternal**, endless, everlasting. (Finite.) **Evade**, equivocate, prevaricate. **Even**, level, plain, smooth. (Uneven.) **Event**, accident, adventure, incident, occurrence. **Evil**, ill, harm, mischief, misfortune. (Good.) **Exact**, nice, particular, punctual. (Inexact.) **Exalt**, ennoble, dignify, raise. (Humble.) **Examination**, investigation, inquiry, research, search, scrutiny. **Exceed**, excel, outdo, surpass, transcend. (Fall Short.) **Exceptional**, uncommon, rare, extraordinary. (Common.) **Excite**, awaken, provoke, rouse, stir up. (Lull.) **Excursion**, jaunt, ramble, tour, trip. **Execute**, fulfill, perform. **Exempt**, free, cleared. (Subject.) **Exercise**, practice. **Exhaustive**, thorough, complete. (Cursory.) **Exigency**, emergency. **Experiment**, proof, trial, test. **Explain**, expound, interpret, illustrate, elucidate. **Express**, declare, signify, utter, tell. **Extend**, reach, stretch. (Abridge.) **Extravagant**, lavish, profuse, prodigal. (Parsimonious.)

FABLE, apologue, novel, romance, tale. **Face**, visage, countenance. **Facetious**, pleasant, jocular, jocose. (Serious.) **Factor**, agent. **Fail**, to fall short, be deficient. (Accomplish.) **Faint**, languid. (Forcible.) **Fair**, clear. (Stormy.) **Fair**, equitable, honest, reasonable. (Unfair.) **Faith**, creed. (Unbelief, infidelity.) **Faithful**, true, loyal, constant. (Faithless.) **Faithless**, perfidious, treacherous, (Faithful.) **Fall**, drop, droop, sink, tumble. (Rise.) **Fame**, renown, reputation, **Famous**, celebrated, renowned, illustrious. (Obscure.) **Fanciful**, capricious, fantastical, whimsical. **Fancy**, imagination. **Fast**, rapid, quick, fleet, expedi-

tious. (Slow.) **Fatigue**, weariness, lassitude. (Vigor.) **Fear**, timidity, timorousness. (Bravery.) **Feeling**, sensation, sense. **Feeling**, sensibility, susceptibility. (Insensibility.) **Ferocious**, fierce, savage, wild, barbarous. (Mild.) **Fertile**, fruitful, prolific, plenteous, productive. (Sterile.) **Fiction**, falsehood, fabrication. (Fact.) **Figure**, allegory, emblem, metaphor, symbol, type **Find**, find out, descry, discover, espy. (Lose, overlook.) **Fine**, *a.*, delicate, nice. (Coarse.) **Fine**, forfeit, forfeiture, mulct, penalty. **Fire**, glow, heat, warmth. **Firm**, constant, solid, steadfast, fixed, stable. (Weak.) **First**, foremost, earliest. (Last.) **Fit**, accommodate, adapt, adjust, suit. **Fix**, determine, establish, settle, limit. **Flame**, blaze, flare, flash, glare. **Flat**, level, even. **Flexible**, pliant, pliable, ductile, supple. (Inflexible.) **Flourish**, prosper, thrive. (Decay.) **Fluctuating**, wavering, hesitating, oscillating, vacillating, change. (Firm, steadfast, decided.) **Fluent**, flowing, glib, voluble, unembarrassed, ready. (Hesitating.) **Folks**, persons, people, individuals. **Follow**, succeed, ensue, imitate, copy, pursue. **Follower**, partisan, disciple, adherent, retainer, pursurer, successor. **Folly**, silliness, foolishness, imbecility, weakness. (Wisdom.) **Fond**, enamored, attached, affectionate. (Distant.) **Fondness**, affection, attachment, kindness, love. (Aversion.) **Foolhardy**, venturesome, incautious, hasty, adventurous, rash. (Cautious.) **Foolish**, simple, silly, irrational, brainless, imbecile, crazy, absurd, preposterous, ridiculous, nonsensical. (Wise, discreet.) **Fop**, dandy, dude, beau, coxcomb, puppy, jackanapes. (Gentlemen.) **Forbear**, abstain, refrain, withhold. **Force**, *n.*, strength, vigor, dint, might, energy, power, violence, army, host. **Force**, *v.*, compel. (Persuade.) **Forecast**, forethought, foresight, premeditation, prognostication. **Forego**, quit, relinquish, let go, waive. **Foregoing**, antecedent, anterior, preceding, previous, prior, former. **Forerunner**, herald, harbinger, precursor, omen. **Foresight**, forethought, forecast, premeditation. **Forge**, coin, invent, frame, feign, fabricate, counterfeit. **Forgive**, pardon, remit, absolve, acquit, excuse, except. **Forlorn**, forsaken, abandoned, deserted, desolate, lone, lonesome. **Form**, *n.*, ceremony, solemnity, observance, rite, figure, shape, conformation, fashion, appearance, representation, semblance. **Form**, *v.*, make, create, produce, constitute, arrange, fashion, mould, shape. **Formal**, ceremonious, precise, exact, stiff, methodical, affected. (Informal, natural.) **Former**, antecedent, anterior, previous, prior, preceding, foregoing. **Forsaken**, abandoned, forlorn, deserted, desolate, lone, lonesome. **Forthwith**, immediately, directly, instantly, instantaneously. (Anon.) **Fortitude**, endurance, resolution, fearlessness, dauntlessness. (Weakness.) **Fortunate**, lucky, happy, auspicious, prosperous, successful. (Unfortunate.) **Fortune**, chance, fate, luck, doom, destiny, property, possession, riches **Foster**, cherish, nurse, tend, harbor, nurture. (Neglect.) **Foul**, impure, nasty, filthy, dirty, unclean, defiled. (Pure, clean.) **Fractious**, cross, captious, petulant, touchy, testy, peevish, fretful, splenetic. (Tractable.) **Fragile**, brittle, frail, delicate, feeble. (Strong.) **Fragments**, pieces, scraps, chips, leavings, remains, remnants. **Frailty**, weakness, failing, foible, imperfection, fault, blemish. (Strength.) **Frame**, *v.*, construct, invent, coin, fabricate, forge, mold, feign, make, compose. **Franchise**, right, exemption, immunity, privilege, freedom, suffrage. **Frank**, artless, candid, sincere, free, easy, familiar, open, ingenuous, plain. (Tricky, insincere.) **Frantic**, distracted, mad, furious, raving, frenzied. (Quiet, subdued.) **Fraud**, deceit, deception, duplicity, guile, cheat, imposition. (Honesty.) **Freak**, fancy, humor, vagary, whim, caprice, crotchet. (Purpose, resolution.) **Free**, *a.*, liberal, generous, bountiful, bounteous, munificent, frank, artless, candid, familiar, open, independent, unconfined, unreserved, unrestricted, exempt, clear, loose, easy, careless. (Slavish, stingy, artful, costly.) **Free**, *v.*, release, set free, deliver, rescue, liberate, enfranchise, affranchise, emancipate, exempt. (Enslave, bind.) **Freedom**, liberty, independence, unrestraint, familiarity, license, franchise, exemption, privilege. (Slavery.) **Frequent**, often, common, usual, general. (Rare.) **Fret**, gall, chafe, agitate, irritate, vex. **Friendly**, amicable, social, sociable. (Distant, reserved, cool.) **Frightful**, fearful, dreadful, dire, direful, terrific, awful, horrible, horrid. **Frivolous**, trifling, trivial, petty. (Serious, earnest.) **Frugal**, provident, economical, saving (Wasteful, extravagant.) **Fruitful**, fertile, prolific, productive, abundant, plentiful, plenteous. (Barren, sterile.) **Fruitless**, vain, useless, idle, abortive, bootless, unavailing, without avail. **Frustrate**, defeat, foil, balk, disappoint. **Fulfill**, accomplish, effect,

complete. **Fully**, completely, abundantly, perfectly. **Fulsome**, coarse, gross, sickening, offensive, rank. (Moderate.) **Furious**, violent, boisterous, vehement, dashing, sweeping, rolling, impetuous, frantic, distracted, stormy, angry, raging, fierce. (Calm.) **Futile**, trifling, trivial, frivolous, useless. (Effective.)

GAIN, *n.*, profit, emolument, advantage, benefit, winnings, earnings. (Loss.) **Gain**, *v.*, get, acquire, obtain, attain, procure, earn, win, achieve, reap, realize, reach. (Lose.) **Gallant**, brave, bold, courageous, gay, fine, showy, intrepid, fearless, heroic. **Galling**, chafing, irritating, vexing. (Soothing.) **Game**, play, pastime, diversion, sport, amusement. **Gang**, band, horde, company, troop, crew. **Gap**, breach, charm, hollow, cavity cleft, crevice, rift, chink. **Garnish**, embellish, adorn, beautify, deck, decorate. **Gather**, pick, cull, assemble, muster, infer, collect. (Scatter.) **Gaudy**, showy, flashy, tawdry, gay, glittering, bespangled. (Sombre.) **Gaunt**, emaciated, scraggy, skinny, meagre, lank, attenuated, spare, lean, thin. (Well-fed.) **Gay**, cheerful, merry, lively, jolly, sprightly, blithe. (Solemn.) **Generate**, form, make, beget, produce. **Generation**, formation, race, breed, stock, kind, age, era. **Generous**, beneficent, noble, honorable, bountiful, liberal, free. (Niggardly.) **Genial**, cordial, hearty, festive, joyous. (Distant, cold.) **Genius**, intellect, invention, talent, taste, nature, character, adept. **Genteel**, refined, polished, fashionable, polite, well-bred. (Boorish.) **Gentle**, placid, mild, bland, meek, tame, docile. (Rough, uncouth.) **Genuine**, real, true, unaffected, sincere. (False.) **Gesture**, attitude, action, posture. **Get**, obtain, earn, gain, attain, procure, achieve. **Ghastly**, pallid, wan, hideous, grim, shocking. **Ghost**, spectre, sprite, apparition, shade, phantom, **Gibe**, scoff, sneer, flout, jeer, mock, taunt, deride. **Giddy**, unsteady, flighty, thoughtless. (Steady.) **Gift**, donation, benefaction, grant, alms, gratuity, boon, present, faculty, talent. (Purchase.) **Gigantic**, colossal, huge, enormous, vast, prodigious, immense. (Diminutive.) **Give**, grant, bestow, confer, yield, impart. **Glad**, pleased, cheerful, joyful, gladsome, gratified, cheering. (Sad.) **Gleam**, glimmer, glance, glitter, shine, flash. **Glee**, gayety, merriment, mirth, jovialty, joviality, catch. (Sorrow.) **Glide**, slip, slide, run, roll on. **Glimmer**, *v.*, gleam, flicker, glitter. **Glimpse**, glance, look, glint. **Glitter**, gleam, shine, glisten, glister, radiate. **Gloom**, cloud, darkness, dimness, blackness, dulness, sadness. (Light, brightness, joy.) **Gloomy**, lowering, lurid, dim, dusky, sad, glum. (Bright, clear.) **Glorify**, magnify, celebrate, adore, exalt. **Glorious**, famous, renowned, distinguished, noble, exalted. (Infamous.) **Glory**, honor, fame, renown, splendor, grandeur. (Infamy.) **Glut**, gorge, stuff, cram, cloy, satiate, block up. **Go**, depart, proceed, move, budge, stir. **God**, creator, lord, almighty, jehovah, omnipotence, providence. **Godly**, righteous, devout, holy, pious, religious. **Good**, benefit, weal, advantage, profit, boon. (Evil.) **Good**, *a.*, virtuous, righteous, upright, just, true. (Wicked, bad.) **Gorge**, glut, fill, cram, stuff, satiate. **Gorgeous**, superb, grand, magnificent, splendid. (Plain, simple.) **Govern**, rule, direct, manage, command. **Government**, rule, state, control, sway. **Graceful**, becoming, comely, elegant, beautiful. (Awkward.) **Gracious**, merciful, kindly, beneficent. **Gradual**, slow, progressive (Sudden.) **Grand**, majestic, stately, dignified, lofty, elevated, exalted, splendid, gorgeous, superb, magnificent, sublime, pompous. (Shabby.) **Grant**, bestow, impart, give, yield, cede, allow, confer, invest. **Grant**, gift, boon, donation. **Graphic**, forcible, telling, picturesque, vivid, pictorial. **Grasp**, catch, seize, gripe, clasp, grapple. **Grateful**, agreeable, pleasing, welcome, thankful. (Harsh.) **Gratification**, enjoyment, pleasure, delight, reward. (Disappointment.) **Grave**, *a.*, serious, sedate, solemn, sober, pressing, heavy. (Giddy.) **Grave**, *s.*, tomb sepulchre, vault. **Great**, big, huge, large, majestic, vast, grand, noble, august (Small.) **Greediness**, avidity, eagerness, voracity. (Generosity.) **Grief**, affliction, sorrow, trial, woe, tribulation. (Joy.) **Grieve**, mourn, lament, sorrow, pain hurt, wound, bewail. (Rejoice.) **Grievous**, painful, afflicting, heavy, baleful unhappy. **Grind**, crush, oppress, grate, harass, afflict. **Grisly**, terrible, hideous grim, ghastly, dreadful. (Pleasing.) **Gross**, coarse, outrageous, unseemly shameful, indelicate. (Delicate.) **Group**, assembly, cluster, collection, clump order, class. **Grovel**, crawl, cringe, fawn, sneak. **Grow**, increase, vegetate, expand, advance. (Decay, diminution.) **Growl**, grumble, snarl, murmur, complain **Grudge**, malice, rancor, spite, pique, hatred, aversion. **Gruff**, rough, rugged

blunt, rude, harsh, surly, bearish. (Pleasant.) **Guile**, deceit, fraud. (Candor.) **Guiltless**, harmless, innocent. **Guilty**, culpable, sinful, criminal.

HABIT, custom, practice. **Hail**, accost, address, greet, salute, welcome. **Happiness**, beatitude, blessedness, bliss, felicity. (Unhappiness.) **Harbor**, haven, port. **Hard**, firm, solid. (Soft.) **Hard**, arduous, difficult. (Easy.) **Harm**, injury, hurt, wrong, infliction. (Benefit.) **Harmless**, safe, innocuous, innocent. (Hurtful.) **Harsh**, rough, rigorous, severe, gruff, morose. (Gentle.) **Hasten**, accelerate, despatch, expédite, speed. (Delay.) **Hasty**, hurried, ill-advised. (Deliberate.) **Hateful**, odious, detestable. (Lovable.) **Hatred**, enmity, ill-will, rancor. (Friendship.) **Haughtiness**, arrogance, pride. (Modesty.) **Haughty**, arrogant, disdainful, supercilious, proud. **Hazard**, risk, venture. **Healthy**, salubrious, salutary, wholesome. (Unhealthy.) **Heap**, accumulate, amass, pile. **Hearty**, *a.*, cordial, sincere, warm. (Insincere.) **Heavy**, burdensome, ponderous, weighty. (Light.) **Heed**, care, attention. **Heighten**, enhance, exalt, elevate, raise. **Heinous**, atrocious, flagitious, flagrant. (Venial.) **Help**, aid, assist, relieve, succor. (Hinder.) **Heretic**, sectary, sectarian, schismatic, dissenter, nonconformist. **Hesitate**, falter, stammer, stutter. **Hideous**, grim, ghastly, grisly. (Beautiful.) **High**, lofty, tall, elevated. (Deep.) **Hinder**, impede, obstruct, prevent. (Help.) **Hint**, allude, refer, suggest, intimate, insinuate. **Hold**, detain, keep, retain. **Holiness**, sanctity, piety, sacredness. **Holy**, devout, pious, religious. **Homely**, plain, ugly, coarse. (Beautiful.) **Honesty**, integrity, probity, uprightness. (Dishonesty.) **Honor**, *v.*, respect, reverence, esteem. (Dishonor.) **Hope**, confidence, expectation, trust. **Hopeless**, desperate. **Hot**, ardent, burning, fiery. (Cold.) **However**, nevertheless, notwithstanding, yet. **Humble**, modest, submissive, plain, unostentatious, simple. (Haughty.) **Humble**, degrade, humiliate, mortify, abase. (Exalt.) **Humor**, mood, temper. **Hunt**, seek, chase. **Hurtful**, noxious, pernicious. (Beneficial.) **Husbandry**, cultivation, tillage. **Hypocrite**, dissembler, impostor, canter. **Hypothesis**, theory, supposition.

IDEA, thought, imagination. **Ideal**, imaginary, fancied. (Actual.) **Idle**, indolent, lazy. (Industrious.) **Ignominious**, shameful, scandalous, infamous. (Honorable.) **Ignominy**, shame, disgrace, obloquy, infamy, reproach. **Ignorant**, unlearned, illiterate, uninformed, uneducated. (Knowing.) **Ill**, *n.*, evil, wickedness, misfortune, mischief, harm. (Good.) **Ill**, *a.*, sick, indisposed, unwell, diseased. (Well.) **Ill-tempered**, crabbed, sour, surly, acrimonious. (Good-natured.) **Ill-will**, enmity, hatred, antipathy. (Good-will.) **Illegal**, unlawful, illicit, contraband, illegitimate. (Legal.) **Illimitable**, boundless, immeasurable, unlimited, infinite. **Illiterate**, unlettered, unlearned, untaught, uninstructed. (Learned, educated.) **Illusion**, fallacy, deception, phantasm. **Illusory**, imaginary, chimerical, visionary. (Real.) **Illustrate**, explain, elucidate, clear. **Illustrious**, celebrated, noble, eminent, famous, renowned. (Obscure.) **Image**, likeness, picture, representation, effigy. **Imaginary**, ideal, fanciful, illusory. (Real.) **Imagine**, conceive, fancy, apprehend, think, presume. **Imbecility**, silliness, senility, dotage. **Imitate**, copy, ape, mimic, mock, counterfeit. **Immaculate**, unspotted, spotless, unsullied, stainless. (Soiled.) **Immediate**, pressing, instant, next, proximate. **Immediately**, instantly, forthwith, directly, presently. **Immense**, vast, enormous, huge, prodigious, monstrous. **Immunity**, privilege, prerogative, exemption. **Impair**, injure, diminish, decrease. **Impart**, reveal, divulge, disclose, discover, bestow, afford. **Impartial**, just, equitable, unbiased. (Partial.) **Impassioned**, glowing, burning, fiery, vehement, intense. **Impeach**, accuse, charge, arraign, censure. **Impede**, hinder, retard, obstruct, prevent. (Help.) **Impediment**, obstruction, hindrance, obstacle, barrier. (Aid.) **Impel**, animate, induce, incite, instigate, embolden. (Retard.) **Impending**, imminent, threatening. **Imperative**, commanding, authoritative, despotic. **Imperfection**, fault, blemish, defect, vice. **Imperil**, endanger, hazard, jeopardize. **Imperious**, commanding, dictatorial, authoritative, imperative, lordly, overbearing, domineering. **Impertinent**, intrusive, meddling, officious, rude, saucy, impudent, insolent. **Impetuous**, violent, boisterous, furious, vehement. (Calm.) **Impious**, profane, irreligious, godless. (Reverent.) **Implicate**, involve, entangle, embarrass, compromise. **Imply**, involve, comprise, infold, import, denote, signify. **Importance**, signification, significance, avail, consequence, weight,

gravity, moment. **Imposing**, impressive, striking, majestic, august, noble, grand. (Insignificant.) **Impotence**, weakness, incapacity, infirmity, frailty, feebleness. (Power.) **Impotent**, weak, feeble, helpless, enfeebled, nerveless, infirm. (Strong.) **Impressive**, stirring, forcible, exciting, affecting, moving. **Imprison**, incarcerate, shut up, immure, confine. (Liberate.) **Imprisonment**, captivity, durance. **Improve**, amend, better, mend, reform, rectify, ameliorate, apply, use, employ. (Deteriorate.) **Improvident**, careless, incautious, imprudent, prodigal, wasteful, reckless, rash. (Thrifty.) **Impudence**, assurance, impertinence, confidence, insolence, rudeness. **Impudent**, saucy, brazen, bold, impertinent, forward, rude, insolent, immodest, shameless. **Impulse**, incentive, incitement, motive, instigation. **Impulsive**, rash, hasty, forcible, violent. (Deliberate.) **Imputation**, blame, censure, reproach, charge, accusation. **Inadvertency**, error, oversight, blunder, inattention, carelessness, negligence. **Incentive**, motive, inducement, impulse. **Incite**, instigate, excite, provoke, stimulate, encourage, urge, impel. **Inclination**, leaning, slope, disposition, tendency, bent, bias, affection, attachment, wish, liking, desire. (Aversion.) **Incline**, *v.*, slope, lean, slant, tend, bend, turn, bias, dispose. **Inclose**, surround, shut in, fence in, cover, wrap. **Include**, comprehend, comprise, contain, embrace, take in. **Incommode**, annoy, plague, molest, disturb, inconvenience, trouble. (Accomodate.) **Incompetent**, incapable, unable, inadequate, insufficient. (Competent.) **Increase**, *v.*, extend, enlarge, augment, dilate, expand, amplify, raise, enhance, aggravate, magnify, grow. (Diminish.) **Increase**, *n.*, augmentation, accession, addition, enlargement, extension. (Decrease.) **Incumbent**, obligatory. **Indefinite**, vague, uncertain, unsettled, loose, lax. (Definite.) **Indicate**, point out, show, mark. **Indifference**, apathy, carelessness, listlessness, insensibility. (Application, assiduity.) **Indigence**, want, neediness, penury, poverty, destitution, privation. (Affluence.) **Indignation**, anger, wrath, ire, resentment. **Indignity**, insult, affront, outrage, obloquy, opprobrium, reproach, ignominy. (Honor.) **Indiscriminate**, promiscuous, chance, indistinct, confused. (Select, chosen.) **Indispensable**, essential, necessary, requisite, expedient. (Unnecessary, supernumerary.) **Indisputable**, undeniable, undoubted, incontestable, indubitable, unquestionable, sure, infallible. **Indorse**, ratify, confirm, superscribe. **Indulge**, foster, cherish, fondle. (Deny.) **Ineffectual**, vain, useless, unavailing, fruitless, abortive, inoperative. (Effective.) **Inequality**, disparity, disproportion, dissimilarity, unevenness. (Equality.) **Inevitable**, unavoidable, not to be avoided, certain. **Infamous**, scandalous, shameful, ignominious, opprobrius, disgraceful. (Honorable.) **Inference**, deduction, corollary, conclusion, consequence. **Infernal**, diabolical, fiendish, devilish, hellish. **Infest**, annoy, plague, harass, disturb. **Infirm**, weak, feeble, enfeebled. (Robust.) **Inflame**, anger, irritate, enrage, chafe, incense, nettle, aggravate, imbitter, exasperate. (Allay, soothe.) **Influence**, *v.*, bias, sway, prejudice, prepossess. **Influence**, *n.*, credit, favor, reputation, character, weight, authority, sway, ascendency. **Infringe**, invade, intrude, contravene, break, transgress, violate. **Ingenuous**, artless, candid, generous, open, frank, plain, sincere. (Crafty.) **Inhuman**, cruel, brutal, savage, barbarous, ruthless, merciless, ferocious. (Humane.) **Iniquity**, injustice, wrong, grievance. **Injure**, damage, hurt, deteriorate, wrong, aggrieve, harm, spoil, mar, sully. (Benefit.) **Injurious**, hurtful, baneful, pernicious, deleterious, noxious, prejudicial, wrongful, damaging. (Beneficial.) **Injustice**, wrong, iniquity, grievance. (Right.) **Innocent**, guiltless, sinless, harmless, inoffensive, innoxious. (Guilty.) **Innocuous**, harmless, safe, innocent. (Hurtful.) **Inordinate**, intemperate, irregular, disorderly, excessive, immoderate. (Moderate.) **Inquiry**, investigation, examination, research, scrutiny, disquisition, question, query, interrogation. **Inquisitive**, prying, peeping, curious, peering. **Insane**, mad, deranged, delirious, demented. (Sane.) **Insanity**, madness, mental aberration, lunacy, delirium. (Sanity.) **Insinuate**, hint, intimate, suggest, infuse, introduce, ingratiate. **Insipid**, dull, flat, mawkish, tasteless, vapid, inanimate, lifeless. (Bright, sparkling.) **Insolent**, rude, saucy, pert, impertinent, abusive, scurrilous, opprobrious, insulting, offensive. **Inspire**, animate, exhilarate, enliven, cheer, breathe, inhale. **Instability**, mutability, fickleness, mutableness, wavering. (Stability, firmness.) **Instigate**, stir up, persuade, animate, incite, urge, stimulate, encourage. **Instil**, implant, inculcate, infuse, insinuate. **Instruct**, inform, teach, educate, enlighten, initiate. **Instrumental**, conducive, assistant, helping,

ministerial. **Insufficiency,** inadequacy, incompetency, incapability, deficiency, lack. **Insult,** affront, outrage, indignity, blasphemy. (Honor.) **Insulting,** insolent, rude, saucy, impertinent, impudent, abusive. **Integrity,** uprightness, honesty, probity, entirety, entireness, completeness, rectitude, purity. (Dishonesty.) **Intellect,** understanding, sense, brains, mind, intelligence, ability, talent, genius. (Body.) **Intellectual,** mental, ideal, metaphysical. (Brutal.) **Intelligible,** clear, obvious, plain, distinct. (Abstruse.) **Intemperate,** immoderate, excessive, drunken, nimious, inordinate. (Temperate.) **Intense,** ardent, earnest, glowing, fervid, burning, vehement. **Intent,** design, purpose, intention, drift, view, aim, purport, meaning. **Intercourse,** commerce, connection, intimacy, acquaintance. **Interdict,** forbid, prohibit, inhibit, proscribe, debar, restrain from. (Allow.) **Interfere,** meddle, intermeddle, interpose. **Interminable,** endless, interminate, infinite, unlimited, illimitable, boundless, limitless. (Brief, concise.) **Interpose,** intercede, arbitrate, mediate, interfere, meddle. **Interpret,** explain, expound, elucidate, unfold, decipher. **Intimate,** hint, suggest, insinuate, express, signify, impart, tell. **Intimidate,** dishearten, alarm, frighten, scare, appal, daunt, cow, browbeat. (Encourage.) **Intolerable,** insufferable, unbearable, insupportable, unendurable. **Intrepid,** bold, brave, daring, fearless, dauntless, undaunted, courageous, valorous, valiant, heroic, gallant, chivalrous, doughty. (Cowardly, faint-hearted.) **Intrigue,** plot, cabal, conspiracy, combination, artifice, ruse, *amour*. **Intrinsic,** real, true, genuine, sterling, native, natural. (Extrinsic.) **Invalidate,** quash, cancel, overthrow, vacate, nullify, annul. **Invasion,** incursion, irruption, inroad, aggression, raid, fray. **Invective,** abuse, reproach, railing, censure, sarcasm, satire. **Invent,** devise, contrive, frame, find out, discover, design. **Investigation,** examination, search, inquiry, research, scrutiny. **Inveterate,** confirmed, chronic, malignant. (Inchoate.) **Invidious,** envious, hateful, odious, malignant. **Invigorate,** brace, harden, nerve, strengthen, fortify. (Enervate.) **Invincible,** unconquerable, impregnable, insurmountable. **Invisible,** unseen, imperceptible, impalpable, unperceivable. **Invite,** ask, call, bid, request, allure, attract, solicit. **Invoke,** invocate, call upon, appeal, refer, implore, beseech. **Involve,** implicate, entangle, compromise, envelop. **Irksome,** wearisome, tiresome, tedious, annoying. (Pleasant.) **Irony,** sarcasm, satire, ridicule, raillery. **Irrational,** foolish, silly, imbecile, brutish, absurd, ridiculous. (Rational.) **Irregular,** eccentric, anomalous, inordinate, intemperate. (Regular.) **Irreligious,** profane, godless, impious, sacrilegious, desecrating. **Irreproachable,** blameless, spotless, irreprovable. **Irresistible,** resistless, irrepressible. **Irresolute,** wavering, undetermined, undecided, vacillating. (Determined.) **Irritable,** excitable, irascible, susceptible, sensitive. (Calm.) **Irritate,** aggravate, worry, embitter, madden, exasperate. **Issue,** *v.*, emerge, rise, proceed, flow, spring, emanate. **Issue,** *n.*, end, upshot, effect, result, offspring, progeny.

JADE, harass, weary, tire, worry. **Jangle,** wrangle, conflict, disagree. **Jarring,** conflicting, discordant, inconsonant, inconsistent. **Jaunt,** ramble, excursion, trip. **Jealousy,** suspicion, envy. **Jeopard,** hazard, peril, endanger. **Jest,** joke, sport, divert, make game of. **Journey,** travel, tour, passage. **Joy,** gladness, mirth, delight. (Grief.) **Judge,** justice, referee, arbitrator. **Joyful,** glad, rejoicing, exultant. (Mournful.) **Judgment,** discernment, discrimination, understanding. **Justice,** equity, right. Justice is right as established by law; equity according to the circumstances of each particular case. (Injustice.) **Justness,** accuracy, correctness, precision.

KEEP, preserve, save. (Abandon.) **Kill,** assassinate, murder, slay. **Kindred,** affinity, consanguinity, relationship. **Knowledge,** erudition, learning, science. (Ignorance.)

LABOR, toil, work, effort, drudgery. (Idleness.) **Lack,** need, deficiency, scarcity, insufficiency. (Plenty.) **Lament,** mourn, grieve, weep. (Rejoice.) **Language,** dialect, idiom, speech, tongue. **Lascivious,** loose, unchaste, lustful, lewd, lecherous. (Chaste.) **Last,** final, latest, ultimate. (First.) **Laudable,** commendable, praiseworthy. (Blamable.) **Laughable,** comical, droll, ludicrous. (Serious.) **Lawful,** legal, legitimate, licit. (Illegal.) **Lead,** conduct, guide. (Follow.) **Lean,** meagre. (Fat.) **Learned,** erudite, scholarly. (Ignorant.) **Leave,** *v.*, quit, relinquish. **Leave,** *n.*, liberty, permission, licence. (Prohibition.)

Life, existence, animation, spirit, vivacity. (Death.) **Lifeless**, dead, inanimate. **Lift**, erect, elevate, exalt, raise. (Lower.) **Light**, clear, bright. (Dark.) **Lightness**, flightiness, giddiness, levity, volatility. (Seriousness.) **Likeness**, resemblance, similarity. (Unlikeness.) **Linger**, lag, loiter, tarry, saunter. (Hasten.) **Little**, diminutive, small. (Great.) **Livelihood**, living, maintenance, subsistence, support. **Lively**, jocund, merry, sportive, sprightly, vivacious. (Slow, languid, sluggish.) **Long**, extended, extensive. (Short.) **Look**, appear, seem. **Lose**, miss, forfeit. (Gain.) **Loss**, detriment, damage, deprivation. (Gain.) **Loud**, clamorous, high-sounding, noisy. (Low, quiet.) **Love**, affection, (Hatred.) **Low**, abject, mean. (Noble.) **Lunacy**, derangement, insanity, mania, madness. (Sanity.) **Lustre**, brightness, brilliancy, splendor. **Luxuriant**, exuberant. (Sparse.)

MACHINATION, plot, intrigue, cabal, conspiracy. (Artlessness.) **Mad**, crazy, delirious, insane, rabid, violent, frantic. (Sane, rational, quiet.) **Madness**, insanity, fury, rage, frenzy. **Magisterial**, august, dignified, majestic, pompous, stately. **Make**, form, create, produce. (Destroy.) **Malediction**, anathema, curse, imprecation, execration. **Malevolent**, malicious, virulent, malignant. (Benevolent.) **Malice**, spite, rancor, ill-feeling, grudge, animosity, ill-will. (Benignity.) **Malicious**, see malevolent. **Manacle**, *v.*, shackle, fetter, chain. (Free.) **Manage**, contrive, concert, direct. **Management**, direction, superintendence, care, economy. **Mangle**, tear, lacerate, mutilate, cripple, maim. **Mania**, madness, insanity, lunacy. **Manifest**, *v.*, reveal, prove, evince, exhibit, display, show. **Manifest**, *a.*, clear, plain, evident. open, apparent, visible. (Hidden, occult.) **Manifold**, several, sundry, various, divers, numerous. **Manly**, masculine, vigorous, courageous, brave, heroic. (Effeminate.) **Manner**, habit, custom, way, air, look, appearance. **Manners**, morals, habits, behavior, carriage. **Mar**, spoil, ruin, disfigure. (Improve.) **March**, tramp, tread, walk, step, space. **Margin**, edge, rim, border, brink, verge. **Mark**, *n.*, sign, note, symptom, token, indication, trace, vestige, track, badge, brand. **Mark**, *v.*, impress, print, stamp, engrave, note, designate. **Marriage**, wedding, nuptials, matrimony, wedlock. **Martial**, military, warlike, soldier-like. **Marvel**, wonder, miracle, prodigy. **Marvelous**, wondrous, wonderful, amazing, miraculous. **Massive**, bulky, heavy, weighty, ponderous, solid, substantial. (Flimsy.) **Mastery**, dominion, rule, sway, ascendancy, supremacy. **Matchless**, unrivaled, unequaled, unparalleled, peerless, incomparable, inimitable, surpassing. (Common, ordinary.) **Material**, *a.*, corporeal, bodily, physical, temporal, momentous, important. (Spiritual, immaterial.) **Maxim**, adage, apophthegm, proverb, saying, by-word, saw. **Meager**, poor, lank, emaciated, barren, dry, uninteresting. (Rich.) **Mean**, *a.*, stingy, niggardly, low, abject, vile, ignoble, degraded, contemptible, vulgar, despicable. (Generous.) **Mean**, *v.*, design, purpose, intent, contemplate, signify, denote, indicate. **Meaning**, signification, import, acceptation, sense, purport. **Medium**, organ, channel, instrument, means. **Medley**, mixture, variety, diversity, miscellany. **Meek**, unassuming, mild, gentle. (Proud.) **Melancholy**, low-spirited, dispirited, dreamy, sad. (Jolly, buoyant.) **Mellow**, ripe, mature, soft. (Immature.) **Melodious**, tuneful, musical, silver, dulcet, sweet. (Discordant.) **Memorable**, signal, distinguished, marked. **Memorial**, monument, memento, commemoration. **Memory**, remembrance, recollection. **Menace**, *n.*, threat. **Mend**, repair, amend, correct, better, ameliorate, improve, rectify. **Mention**, tell, name, communicate, impart, divulge, reveal, disclose, inform, acquaint. **Merciful**, compassionate, lenient, clement, tender, gracious, kind. (Cruel.) **Merciless**, hard-hearted, cruel, unmerciful, pitiless, remorseless, unrelenting. (Kind.) **Merriment**, mirth, joviality, jollity, hilarity. (Sorrow.) **Merry**, cheerful, mirthful, joyous, gay, lively, sprightly, hilarious, blithe, blithesome, jovial, sportive, jolly. (Sad.) **Metaphorical**, figurative, allegorical, symbolical. **Method**, way, manner, mode, process, order, rule, regularity, system. **Mien**, air, look, manner, aspect, appearance. **Migratory**, roving, strolling, wandering, vagrant. (Settled, sedate, permanent.) **Mimic**, imitate, ape; mock. **Mindful**, observant, attentive, heedful, thoughtful. (Heedless.) **Miscellaneous**, promiscuous, indiscriminate, mixed. **Mischief**, injury, harm, damage, hurt, evil, ill. (Benefit.) **Miscreant**, caitiff, villain, ruffian. **Miserable**, unhappy, wretched, distressed, afflicted. (Happy.) **Miserly**, stingy, niggardly, avaricious, griping. **Misery**, wretched-

ness, woe, destitution, penury, privation, beggary. (Happiness.) **Misfortune,** calamity, disaster, mishap, catastrophe. (Good luck.) **Miss,** omit, lose, fail, miscarry. **Mitigate,** alleviate, relieve, abate, diminish. (Aggravate.) **Moderate,** temperate, abstemious, sober, abstinent. (Immoderate.) **Modest,** chaste, virtuous, bashful, reserved. (Immodest.) **Moist,** wet, damp, dank, humid. (Dry.) **Monotonous,** unvaried, dull, tiresome, undiversified. (Varied.) **Monstrous,** shocking, dreadful, horrible, huge, immense. **Monument,** memorial, record, remembrancer, cenotaph. **Mood,** humor, disposition, vein, temper. **Morbid,** sick, ailing, sickly, diseased, corrupted. (Normal, sound.) **Morose,** gloomy, sullen, surly, fretful, crabbed, crusty. (Joyous.) **Mortal,** deadly, fatal, human. **Motion,** proposition, proposal, movement. **Motionless,** still, stationary, torpid, stagnant. (Active, moving.) **Mount,** arise, rise, ascend, soar, tower, climb, scale. **Mournful,** sad, sorrowful, lugubrious, grievous, doleful, heavy. (Happy.) **Move,** actuate, impel, induce, prompt, instigate, persuade, stir, agitate, propel, push. **Multitude,** crowd, throng, host, mob, swarm. **Murder,** *v.*, kill, assassinate, slay, massacre, despatch. **Muse,** *v.*, meditate, contemplate, think, reflect, cogitate, ponder. **Music,** harmony, melody, symphony. **Musical,** tuneful, melodious, harmonious, dulcet, sweet. **Musty,** stale, sour, fetid. (Fresh, sweet.) **Mute,** dumb, silent, speechless. **Mutilate,** maim, cripple, disable, disfigure. **Mutinous,** insurgent, seditious, tumultuous, turbulent, riotous. (Obedient, orderly.) **Mutual,** reciprocal, interchanged, correlative. (Sole, solitary.) **Mysterious,** dark, obscure, hidden, secret, dim, mystic, enigmatical, unaccountable. (Open, clear.) **Mystify,** confuse, perplex, puzzle. (Clear, explain.)

NAKED, nude, bare, uncovered, unclothed, rough, rude, simple. (Covered, clad.) **Name,** *v.*, denominate, entitle, style, designate, term, call, christen. **Name,** *n.*, appellation, designation, denomination, title, cognomen, reputation, character, fame, credit, repute. **Narrate,** tell, relate, detail, recount, describe, enumerate, rehearse, recite. **Nasty,** filthy, foul, dirty, unclean, impure, indecent, gross, vile. **Nation,** people, community, realm, state. **Native,** indigenous, inborn, vernacular. **Natural,** original, regular, normal, bastard. (Unnatural, forced.) **Near,** nigh, neighboring, close, adjacent, contiguous, intimate. (Distant.) **Necessary,** needful, expedient, essential, requisite, indispensable. (Useless.) **Necessitate,** *v.*, compel, force, oblige. **Necessity,** need, occasion, exigency, emergency, urgency, requisite. **Need,** *n.*, necessity, distress, poverty, indigence, want, penury. **Need,** *v.*, require, want, lack. **Neglect,** *v.*, disregard, slight, omit, overlook. **Neglect,** *n.*, omission, failure, default, negligence, remissness, carelessness, slight. **Neighborhood,** environs, vicinity, nearness, adjacency, proximity. **Nervous,** timid, timorous, shaky. **New,** fresh, recent, novel. (Old.) **News,** tidings, intelligence, information. **Nice,** exact, accurate, good, particular, precise, fine, delicate. (Careless, coarse, unpleasant.) **Nimble,** active, brisk, lively, alert, quick, agile, prompt. (Awkward.) **Nobility,** aristocracy, greatness, grandeur, peerage. **Noble,** exalted, elevated, illustrious, great, grand, lofty. (Low.) **Noise,** cry, outcry, clamor, row, din, uproar, tumult. (Silence.) **Nonsensical,** irrational, absurd, silly, foolish. (Sensible.) **Notable,** plain, evident, remarkable, signal, striking, rare. (Obscure.) **Note,** *s.*, token, symbol, mark, sign, indication, remark, comment. **Noted,** distinguished, remarkable, eminent, renowned. (Obscure.) **Notice,** *s.*, advice, notification, intelligence, information. **Notice,** *v.*, mark, note, observe, attend to, regard, heed. **Notify,** *v.*, publish, acquaint, apprise, inform, declare. **Notion,** conception, idea, belief, opinion, sentiment. **Notorious,** conspicuous, open, obvious, ill-famed. (Unknown.) **Nourish,** nurture, cherish, foster, supply. (Starve, famish.) **Nourishment,** food, diet, sustenance, nutrition. **Novel,** modern, new, fresh, recent, unused, strange, rare. (Old.) **Noxious,** hurtful, deadly, poisonous, deleterious, baneful. (Beneficial.) **Nullify,** annul, vacate, invalidate, quash, cancel, repeal. (Affirm.) **Nutrition,** food, diet, nutriment, nourishment.

OBDURATE, hard, callous, hardened, unfeeling, insensible. (Yielding, tractable.) **Obedient,** compliant, submissive, dutiful, respectful. (Obstinate.) **Obese,** corpulent, fat, adipose, fleshy. (Attenuated.) **Obey,** *v.*, conform, comply, submit. (Rebel, disobey.) **Object,** *s.*, aim, end, purpose, design, mark, butt. **Object,** *v.*, oppose, except to, contravene, impeach, deprecate. (Assent.) **Obnoxious,** offensive. (Agreeable.) **Obscure,** undistinguished, unknown. (Distinguished.)

Obstinate, contumacious, headstrong, stubborn, obdurate. (Yielding.) **Occasion**, opportunity. **Offense**, affront, misdeed, misdemeanor, transgression, trespass. **Offensive**, insolent, abusive, obnoxious. (Inoffensive.) **Office**, charge, function, place. **Offspring**, issue, progeny. **Old**, aged, superannuated, ancient, antique, antiquated, obsolete, old-fashioned. (Young, new.) **Omen**, presage, prognostic. **Opaque**, dark. (Bright, transparent.) **Open**, candid, unreserved, clear, fair. (Hidden, dark.) **Opinion**, notion, view, judgment, belief, sentiment. **Opinionated**, conceited, egoistical. (Modest.) **Oppose**, resist, withstand, thwart. (Give way.) **Option**, choice. **Order**, method, rule, system, regularity. (Disorder.) **Origin**, cause, occasion, beginning, source. (End.) **Outlive**, survive. **Outward**, external, outside, exterior. (Inner.) **Over**, above. (Under.) **Overbalance**, outweigh, preponderate. **Overbear**, bear down, overwhelm, overpower, subdue. **Overbearing**, haughty, arrogant, proud. (Gentle.) **Overflow**, inundation, deluge. **Overrule**, supersede, suppress. **Overspread**, overrun, ravage. **Overturn**, invert, overthrow, reverse, subvert. (Establish, fortify.) **Overwhelm**, crush, defeat, vanquish.

PAIN, suffering, qualm, pang, agony, anguish. (Pleasure.) **Pallid**, pale, wan. (Florid.) **Part**, division, portion, share, fraction. (Whole.) **Particular**, exact, distinct, odd, singular, strange. (General.) **Patient**, passive, submissive, meek. (Obdurate.) **Peace**, calm, quiet, tranquillity. (War, riot, trouble, turbulence.) **Peaceable**, pacific, peaceful, quiet. (Troublesome, riotous.) **Penetrate**, bore, pierce, perforate. **Penetration**, acuteness, sagacity. (Dullness.) **People**, nation, persons, folks. **Perceive**, note, observe, discern, distinguish. **Perception**, conception, notion, idea. **Peril**, danger, pitfall, snare. (Safety.) **Permit**, allow, tolerate. (Forbid.) **Persuade**, allure, entice, prevail upon. **Physical**, corporeal, bodily, material. (Mental.) **Picture**, engraving, print, representation, illustration, image. **Piteous**, doleful, woful, rueful. (Joyful.) **Pitiless**, see merciless. **Pity**, compassion, sympathy. (Cruelty.) **Place**, *n.*, spot, site, position, post, situation, station. **Place**, *v.*, order, dispose. **Plain**, open, manifest, evident. (Secret.) **Play**, game, sport, amusement. (Work.) **Please**, gratify, pacify. (Displease.) **Pleasure**, charm, delight, joy. (Pain.) **Plentiful**, abundant, ample, copious, plenteous. (Scarce.) **Poise**, balance. **Positive**, absolute, peremptory, decided, certain. (Negative.) **Possessor**, owner, master, proprietor. **Possible**, practical, practicable. (Impossible.) **Poverty**, penury, indigence, need, want. (Wealth.) **Power**, authority, force, strength, dominion. **Powerful**, mighty, potent. (Weak.) **Praise**, commend, extol, laud. (Blame.) **Prayer**, entreaty, petition, request, suit. **Pretense**, *n.*, pretext, subterfuge. **Prevailing**, predominant, prevalent, general. (Isolated, sporadic.) **Prevent**, *v.*, obviate, preclude. **Previous**, antecedent, introductory, preparatory, preliminary. (Subsequent.) **Pride**, vanity, conceit. (Humility.) **Principally**, chiefly, essentially, mainly. **Principle**, ground, reason, motive, impulse, maxim, rule, rectitude, integrity. **Privilege**, immunity, advantage, favor, prerogative, exemption, right, claim. **Probity**, rectitude, uprightness, honesty, integrity, sincerity, soundness. (Dishonesty.) **Problematical**, uncertain, doubtful, dubious, questionable, disputable, suspicious. (Certain.) **Prodigious**, huge, enormous, vast, amazing, astonishing, astounding, surprising, remarkable, wonderful. (Insignificant.) **Profession**, business, trade, occupation, vocation, office, employment, engagement, avowal. **Proffer**, volunteer, offer, propose, tender. **Profligate**, abandoned, dissolute, depraved, vicious, degenerate, corrupt, demoralized. (Virtuous.) **Profound**, deep, fathomless, penetrating, solemn, abstruse, recondite. (Shallow.) **Profuse**, extravagant, prodigal, lavish, improvident, excessive, copious, plentiful. (Succinct.) **Prolific**, productive, generative, fertile, fruitful, teeming. (Barren.) **Prolix**, diffuse, long, prolonged, tedious, tiresome, wordy, verbose, prosaic. (Concise, brief.) **Prominent**, eminent, conspicuous, marked, important, leading. (Obscure.) **Promiscuous**, mixed, unarranged, mingled, indiscriminate. (Select.) **Prompt**, see punctual. **Prop**, *v.*, maintain, sustain, support, stay. **Propagate**, spread, circulate, diffuse, disseminate, extend, breed, increase. (Suppress.) **Proper**, legitimate, right, just, fair, equitable, honest, suitable, fit, adapted, meet, becoming, befitting, decent, pertinent, appropriate. (Wrong.) **Prosper**, flourish, succeed, grow rich, thrive, advance. (Fail.) **Prosperity**, well-being, weal, welfare, happiness, good luck. (Poverty.) **Proxy**, agent, representative, substitute,

delegate, deputy. **Prudence**, carefulness, judgment, discretion, wisdom (Indiscretion.) **Prurient**, itching, craving, hankering, longing. **Puerile**, youthful, juvenile, boyish, childish, infantile, trifling, weak, silly. (Mature.) **Punctilious**, nice, particular, formal, precise. (Negligent.) **Punctual**, exact, precise, nice, particular, prompt, timely. (Dilatory.) **Putrefy**, rot, decompose, corrupt, decay. **Puzzle**, *v.*, perplex, confound, embarrass, bewilder, confuse, pose, mystify. (Enlighten.)

QUACK, impostor, pretender, charlatan, empiric, mountebank. (Savant.) **Quaint**, artful, curious, far-fetched, fanciful, odd, singular. **Qualified**, competent, fitted, adapted. (Incompetent.) **Quality**, attribute, rank, distinction. **Querulous**, doubting, complaining, fretting, repining. (Patient.) **Question**, query, inquiry, interrogatory. **Quibble**, cavil, evade, equivocate, shuffle, prevaricate. **Quick**, lively, ready, prompt, alert, nimble, agile, active, brisk, expeditious, adroit, fleet, rapid, swift, impetuous, sweeping, dashing, clever, sharp. (Slow.) **Quote**, note, repeat, cite, adduce.

RABID, mad, furious, raging, frantic. (Rational.) **Race**, course, match, pursuit, career, family, clan, house, ancestry, lineage, pedigree. **Rack**, agonize, wring, torture, excruciate, distress, harass. (Soothe.) **Racy**, spicy, pungent, smart, spirited, lively, vivacious. (Dull, insipid.) **Radiance**, splendor, brightness, brilliance, brilliancy, lustre, glare. (Dullness.) **Radical**, organic, innate, fundamental, original, constitutional, inherent, complete, entire. (Superficial. In a political sense, uncompromising; antonym, moderate.) **Rancid**, fetid, rank, stinking, sour, tainted, reasty. (Fresh, sweet.) **Rancor**, malignity, hatred, hostility, antipathy, animosity, enmity, ill-will, spite. (Forgiveness.) **Rank**, order, degree, dignity, nobility, consideration. **Ransack**, rummage, pillage, overhaul, explore, plunder. **Ransom**, emancipate, free, unfetter. **Rant**, bombast, fustian, cant. **Rapacious**, ravenous, voracious, greedy, grasping. (Generous.) **Rapt**, ecstatic, transported, ravished, entranced, charmed. (Distracted.) **Rapture**, ecstasy, transport, delight, bliss. (Dejection.) **Rare**, scarce, singular, uncommon, unique. **Rascal**, scoundrel, rogue, knave, scamp, vagabond. **Rash**, hasty, precipitate, foolhardy, adventurous, heedless, reckless, careless. (Deliberate.) **Rate**, value, compute, appraise, estimate, chide, abuse. **Ratify**, confirm, establish, substantiate, sanction. (Protest, oppose. **Rational**, reasonable, sagacious, judicious, wise, sensible, sound. (Unreasonable.) **Ravage**, overrun, overspread, desolate, despoil, destroy. **Ravish**, enrapture, enchant, charm, delight, abuse. **Raze**, demolish, destroy, overthrow, ruin, dismantle (Build up.) **Reach**, touch, stretch, attain, gain, arrive at. **Ready**. prepared, ripe, apt, prompt, adroit, handy. (Slow, dilatory.) **Real**, actual, literal, practical, positive, certain, genuine, true. (Unreal.) **Realize**, accomplish, achieve, effect, gain, get, acquire, comprehend. **Reap**, gain, get, acquire, obtain. **Reason**, motive, design, end, proof, cause, ground, purpose. **Reason**, deduce, draw from, trace, infer, conclude. **Reasonable**, rational, wise, honest, fair, right, just. (Unreasonable.) **Rebellion**, insurrection, revolt. **Recant**, recall, abjure, retract, revoke. **Recede**, retire, retreat, withdraw, ebb. **Receive**, accept, take, admit, entertain. **Reception**, receiving, levee, receipt, admission. **Recess**, retreat, depth, niche, vacation, intermission. **Recreation**, sport, pastime, play, amusement, game, fun. **Redeem**, ransom, recover, rescue, deliver, save, free. **Redress**, remedy, repair, remission, abatement, relief. **Reduce**, abate, lessen, decrease, lower, shorten, conquer. **Refined**, polite, courtly, polished, cultured, genteel, purified. (Boorish.) **Reflect**, consider, cogitate, think, ponder, muse, censure. **Reform**, amend, correct, better, restore, improve. (Corrupt) **Reformation**, improvement, reform, amendment. (Corruption.) **Refuge**, asylum, protection, harbor, shelter, retreat. **Refuse**, *v.*, deny, reject, repudiate, decline, withhold. (Accept.) **Refuse**, *s.*, dregs, dross, scum, rubbish, leavings, remains. **Refute**, disprove, falsify, negative. (Affirm.) **Regard**, *v.*, mind, heed, notice, behold, view, consider, respect. **Regret**, *s.*, grief, sorrow, lamentation, repentance, remorse. **Regular**, orderly, uniform, customary, ordinary, stated. (Irregular.) **Regulate**, methodize, arrange, adjust, organize, govern, rule. (Disorder.) **Reimburse**, refund, repay, satisfy, indemnify. **Relevant**, fit, proper, suitable, appropriate, pertinent, apt. (Irrelevant.) **Reliance**, trust, hope, dependence, confidence. (Suspicion.) **Relief**, succor, aid,

help, redress, alleviation. **Relinquish**, give up, forsake, resign, surrender, quit, leave, forego. (Retain.) **Remedy**, help, relief, redress, cure, specific, reparation. **Remorseless**, pitiless, relentless, cruel, ruthless, merciless, barbarous. (Merciful, humane.) **Remote**, distant, far, secluded, indirect. (Near.) **Reproduce**, propagate, imitate, represent, copy. **Repudiate**, disown, discord, disavow, renounce, disclaim. (Acknowledge.) **Repugnant**, antagonistic, distasteful. (Agreeable.) **Repulsive**, forbidding, odious, ugly, disagreeable, revolting. (Attractive.) **Respite**, reprieve, interval, stop, pause. **Revenge**, vengeance, retaliation, requital, retribution. (Forgiveness.) **Revenue**, produce, income, fruits, proceeds, wealth. **Reverence**, *n.*, honor, respect, awe, veneration, deference, worship, homage. (Execration.) **Revise**, review, reconsider. **Revive**, refresh, renew, renovate, animate, resuscitate, vivify, cheer, comfort. **Rich**, wealthy, affluent, opulent, copious, ample, abundant, exuberant, plentiful, fertile, fruitful, superb, gorgeous. (Poor.) **Rival**, *n.*, antagonist, opponent, competitor. **Road**, way, highway, route, course, path, pathway, anchorage. **Roam**, ramble, rove, wander, stray, stroll **Robust**, strong, lusty, vigorous, sinewy, stout, sturdy, stalwart, able-bodied. (Puny.) **Rout**, *v.*, discomfit, beat, defeat, overthrow, scatter. **Route**, road, course, march way, journey, path, direction. **Rude**, rugged, rough, uncouth, unpolished, harsh, gruff, impertinent, saucy, flippant, impudent, insolent, churlish. (Polished, polite.) **Rule**, sway, method, system, law, maxim, precept, guide, formula, regulation, government, standard, test. **Rumor**, hearsay, talk, fame, report, bruit. **Ruthless**, cruel, savage, barbarous, inhuman, merciless, remorseless, relentless, unrelenting. (Considerate.)

SACRED, holy, hallowed, divine, consecrated, dedicated, devoted. (Profane.) **Safe**, secure, harmless, trustworthy, reliable. (Perilous, dangerous.) **Sanction**, confirm, countenance, encourage, support, ratify, authorize. (Disapprove.) **Sane**, sober, lucid, sound, rational. (Crazy.) **Saucy**, impertinent, rude, impudent, insolent, flippant, forward. (Modest.) **Scandalize**, shock, disgust, offend, calumniate, vilify, revile, malign, traduce, defame, slander. **Scanty**, bare, pinched, insufficient, slender, meager. (Ample.) **Scatter**, strew, spread, disseminate, disperse, dissipate, dispel. (Collect.) **Secret**, clandestine, concealed, hidden, sly, underhand, latent, private. (Open.) **Seduce**, allure, attract, decoy, entice, abduct, inveigle, deprave. **Sense**, discernment, appreciation, view, opinion, feeling, perception, sensibility, susceptibility, thought, judgment, signification, import, significance, meaning, purport, wisdom. **Sensible**, wise, intelligent, reasonable, sober, sound, conscious, aware. (Foolish.) **Settle**, arrange, adjust, regulate, conclude, determine. **Several**, sundry, divers, various, many. **Severe**, harsh, stern, stringent, unmitigated, rough, unyielding. (Lenient.) **Shake**, tremble, shudder, shiver, quake, quiver. **Shallow**, superficial, flimsy, slight. (Deep, thorough.) **Shame**, disgrace, dishonor. (Honor.) **Shameful**, degrading, scandalous, disgraceful, outrageous. (Honorable.) **Shameless**, immodest, impudent, indecent, indelicate, brazen. **Shape**, form, fashion, mold, model. **Share**, portion, lot, division, quantity, quota, contingent. **Sharp**, acute, keen. (Dull.) **Shine**, glare, glitter, radiate, sparkle. **Short**, brief, concise, succinct, summary. (Long.) **Show**, *v.*, indicate, mark, point out, exhibit, display. **Show**, *n.*, exhibition, representation, sight, spectacle. **Sick**, diseased, sickly, unhealthy, morbid. (Healthy.) **Sickness**, *n.*, illness, indisposition, disease, disorder. (Health.) **Significant**, *a.*, expressive, material, important. (Insignificant.) **Signification**, import, meaning, sense. **Silence**, speechlessness dumbness. (Noise.) **Silent**, dumb, mute, speechless. (Talkative.) **Simile**, comparison, similitude. **Simple**, single, uncompounded, artless, plain. (Complex, compound.) **Simulate**, dissimulate, dissemble, pretend. **Sincere**, candid, hearty, honest, pure, genuine, real. (Insincere.) Situation, condition, plight, predicament, state, position. **Size**, bulk, greatness, magnitude, dimension. **Slavery**, servitude, enthrallment, thralldom. (Freedom.) **Sleep**, doze, drowse, nap, slumber. **Sleepy**, somnolent. (Wakeful.) **Slow**, dilatory, tardy. (Fast.) **Smell**, fragrance, odor, perfume, scent. **Smooth**, even, level, mild. (Rough.) **Soak**, drench, imbrue, steep. **Social**, sociable, friendly, communicative. (Unsocial.) **Soft**, gentle, meek, mild. (Hard.) **Solicit**, importune, urge. **Solitary**, sole, only, single. **Sorry**, grieved, poor, paltry, insignificant. (Glad, respectable.) **Soul**, mind, spirit. (Soul is opposed to body, mind to matter.) **Sound**, *v.*, healthy, sane. (Unsound.)

Sound, *n.*, tone, noise, silence. **Space,** room. **Sparse,** scanty, thin. (Luxuriant.) **Speak,** converse, talk, confer, say, tell. **Special,** particular, specific. (General.) **Spend,** expend, exhaust, consume, waste, squander, dissipate. (Save.) **Sporadic,** isolated, rare. (General, prevalent.) **Spread,** disperse, diffuse, expand, disseminate, scatter. **Spring,** fountain, source. **Staff,** prop, support, stay. **Stagger,** reel, totter. **Stain,** soil, discolor, spot, sully, tarnish. **State,** commonwealth, realm. **Sterile,** barren, unfruitful. (Fertile.) **Stifle,** choke, suffocate, smother. **Stormy,** rough, boisterous, tempestuous. (Calm.) **Straight,** direct, right. (Crooked.) **Strait,** *a.*, narrow, confined. **Stranger,** alien, foreigner. (Friend.) **Strengthen,** fortify, invigorate. (Weaken.) **Strong,** robust, sturdy, powerful. (Weak.) **Stupid,** dull, foolish, obtuse, witless. (Clever.) **Subject,** exposed to, liable, obnoxious. (Exempt.) **Subject,** inferior, subordinate. (Superior to, above.) **Subsequent,** succeeding, following. (Previous.) **Substantial,** solid, durable. (Unsubstantial.) **Suit,** accord, agree. (Disagree.) **Superficial,** flimsy, shallow, untrustworthy. (Thorough.) **Superfluous,** unnecessary, excessive. (Necessary.) **Surround,** encircle, encompass, environ. **Sustain,** maintain, support. **Symmetry,** proportion. **Sympathy,** commiseration, compassion, condolence. **System,** method, plan, order. **Systematic,** orderly, regular, methodical. (Chaotic.)

TAKE, accept, receive. (Give.) **Talkative,** garrulous, loquacious, communicative. (Silent.) **Taste,** flavor, relish, savor. (Tastlessness.) **Tax,** custom, duty, impost, excise, toll. **Tax,** assessment, rate. **Tease,** taunt, tantalize, torment, vex. **Temporary,** *a.*, fleeting, transient, transitory. (Permanent.) **Tenacious,** pertinacious, retentive. **Tendency,** aim, drift, scope. **Tenet,** position, view, conviction, belief. **Term,** boundary, limit, period, time. **Territory,** dominion. **Thankful,** grateful, obliged. (Thankless.) **Thankless,** ungracious, profitless, ungrateful, unthankful. **Thaw,** melt, dissolve, liquefy. (Freeze.) **Theatrical,** dramatic, showy, ceremonious, meretricious. **Theft,** robbery, depredation, spoliation. **Theme,** subject, topic, text, essay. **Theory,** speculation, scheme, plea, hypothesis, conjecture. **Therefore,** accordingly, consequently, hence. **Thick,** dense, close, compact, solid, coagulated, muddy, turbid, misty, foggy, vaporous. (Thin.) **Thin,** slim, slender, slight, flimsy, lean, attenuated, scraggy. **Think,** cogitate, consider, reflect, ponder, contemplate, meditate, muse, conceive, fancy, imagine, apprehend, hold, esteem, reckon, consider, regard, deem, believe, opine. **Thorough,** accurate, correct, trustworthy, reliable, complete. (Superficial.) **Thought,** idea, conception, imagination, fancy, conceit, notion, supposition, care, provision, consideration, opinion, view, sentiment, reflection, deliberation. **Thoughtful,** considerate, careful, cautious, heedful, contemplative, reflective, provident, pensive, dreamy. (Thoughtless.) **Thoughtless,** inconsiderate, rash, precipitate, improvident, heedless. **Tie,** *v.*, bind, restrain, restrict, oblige, secure, unite, join. (Loose.) **Tie,** *n.*, band, ligament, ligature. **Time,** duration, season, period, era, age, date, span, spell. **Tolerate,** allow, admit, receive, suffer, permit, let, endure, abide. (Oppose.) **Top,** summit, apex, head, crown, surface. (Bottom, base.) **Torrid,** burning, hot, parching, scorching, sultry. **Tortuous,** twisted, winding, crooked, indirect. **Torture,** torment, anguish, agony. **Touching,** tender, affecting, moving, pathetic. **Tractable,** docile, manageable, amenable. **Trade,** traffic, commerce, dealing, occupation, employment, office. **Traditional,** oral, uncertain, transmitted. **Traffic,** trade, exchange, commerce, intercourse. **Trammel,** *n.*, fetter, shackle, clog, bond, chain, impediment, hindrance. **Tranquil,** still, unruffled, peaceful, quiet, hushed. (Noisy, boisterous.) **Transaction,** negotiation, occurrence, proceeding, affair. **Trash,** nonsense, twaddle, trifles, dross. **Travel,** trip, ramble, peregrination, excursion, journey, tour, voyage. **Treacherous,** traitorous, disloyal, treasonable, faithless, false-hearted, perfidious, sly, false. (Trustworthy, faithful.) **Trite,** stale, old, ordinary, commonplace, hackneyed. (Novel.) **Triumph,** achievement, ovation, victory, conquest, jubilation. (Failure, defeat.) **Trivial,** trifling, petty, small, frivolous, unimportant, insignificant. (Important.) **True,** genuine, actual, sincere, unaffected, true-hearted, honest, upright, veritable, real, veracious, authentic, exact, accurate, correct. **Tumultuous,** turbulent, riotous, disorderly, disturbed, confused, unruly. (Orderly.) **Tune,** tone, air, melody, strain. **Turbid,** foul, thick,

muddy, impure, unsettled. (Placid.) **Type,** emblem, symbol, figure, sign, kind, sort, letter. **Tyro,** novice, beginner, learner.

UGLY, unsightly, plain, homely, ill-favored, hideous. (Beautiful.) **Umbrage,** offence, dissatisfaction, displeasure, resentment. **Umpire,** referee, arbitrator, judge, arbiter. **Unanimity,** accord, agreement, unity, concord. (Discord.) **Unanimous,** agreeing, like-minded. **Unbridled,** wanton, licentious, dissolute, loose, lax. **Uncertain,** doubtful, dubious, questionable, fitful, equivocal, ambiguous, indistinct, variable, fluctuating. **Uncivil,** rude, discourteous, disrespectful, disobliging. (Civil.) **Unclean,** dirty, foul, filthy, sullied. (Clean.) **Uncommon,** rare, strange, scarce, singular, choice. (Common, ordinary.) **Unconcerned,** careless, indifferent, apathetic. (Anxious.) **Uncouth,** strange, odd, clumsy, ungainly. (Graceful.) **Uncover,** reveal, strip, expose, lay bare, divest. (Hide.) **Under,** below, underneath, beneath, subordinate, lower, inferior. (Above.) **Understanding,** knowledge, intellect, intelligence, faculty, comprehension, mind, reason, brains. **Undertake,** engage in, embark in, agree, promise. **Undo,** annul, frustrate, untie, unfasten, destroy. **Uneasy,** restless, disturbed, unquiet, stiff, awkward. (Quiet.) **Unequal,** uneven, not alike, irregular, insufficient. (Even.) **Unequaled,** matchless, unique, novel, new, unheard of. **Unfair,** wrongful, dishonest, unjust. (Fair.) **Unfit,** *a.*, improper, unsuitable, inconsistent, untimely, incompetent. (Fit.) **Unfit,** *v.*, disable, incapacitate, disqualify. (Fit.) **Unfortunate,** calamitous, ill-fated, unlucky, wretched, unhappy, miserable. (Fortunate.) **Ungainly,** clumsy, awkward, lumbering, uncouth. (Pretty.) **Unhappy,** miserable, wretched, distressed, afflicted, painful, disastrous, drear, dismal. (Happy.) **Uniform,** regular, symmetrical, equal, even, alike, unvaried. (Irregular.) **Uninterrupted,** continuous, perpetual, unceasing, incessant, endless. (Intermittent.) **Union,** junction, combination, alliance, confederacy, league, coalition, agreement, concert. (Disunion, separation.) **Unique,** unequal, uncommon, rare, choice, matchless. (Common, ordinary.) **Unite,** join, conjoin, combine, concert, add, attach, incorporate, embody, clench, merge. (Separate, disrupt, sunder.) **Universal,** general, all, entire, total, catholic. (Sectional.) **Unlimited,** absolute, undefined, boundless, infinite. (Limited.) **Unreasonable,** foolish, silly, absurd, preposterous, ridiculous. **Unrivaled,** unequaled, unique, unexampled, incomparable, matchless. (Mediocre.) **Unroll,** unfold, open, discover. **Unruly,** ungovernable, unmanageable, refractory. (Tractable, docile.) **Unusual,** rare, unwonted, singular, uncommon, remarkable, strange, extraordinary. (Common.) **Uphold,** maintain, defend, sustain, support, vindicate. (Desert, abandon.) **Upright,** vertical, perpendicular, erect, just, equitable, fair, pure, honorable. (Prone, horizontal.) **Uprightness,** honesty, integrity, fairness, goodness, probity, virtue, honor. (Dishonesty.) **Urge,** incite, impel, push, drive, instigate, stimulate, press, induce, solicit. **Urgent,** pressing, important, imperative, immediate, serious, wanted. (Unimportant.) **Usage,** custom, fashion, practice, prescription. **Use,** *n.*, usage, practice, habit, custom, avail, advantage, utility, benefit, application. (Disuse, desuetude.) **Use,** *v.*, employ, exercise, occupy, practise, accustom, inure. (Abuse.) **Useful,** advantageous, serviceable, available, helpful, beneficial, good. (Useless.) **Useless,** unserviceable, fruitless, idle, profitless. (Useful.) **Usual,** ordinary, common, accustomed, habitual, wonted, customary, general. (Unusual.) **Usurp,** arrogate, seize, appropriate, assume. **Utmost,** farthest, remotest, uttermost, greatest. **Utter,** *a.*, extreme, excessive, sheer, mere, pure. **Utter,** *v.*, speak, articulate, pronounce, express, issue. **Utterly,** totally, completely, wholly, quite, altogether, entirely.

VACANT, empty, unfilled, unoccupied, thoughtless, unthinking. (Occupied.) **Vagrant,** *n.*, wanderer, beggar, tramp, vagabond, rogue. **Vague,** unsettled, undetermined, uncertain, pointless, indefinite. (Definite.) **Vain,** useless, fruitless, empty, worthless, inflated, proud, conceited, unreal, unavailing. (Effectual, humble, real.) **Valiant,** brave, bold, valorous, courageous, gallant. (Cowardly.) **Valid,** weighty, strong, powerful, sound, binding, efficient. (Invalid.) **Valor,** courage, gallantry, boldness, bravery, heroism. (Cowardice.) **Value,** *v.*, appraise, assess, reckon, appreciate, estimate, prize, esteem, treasure. (Despise, condemn.) **Vanish,** disappear, fade, melt, dissolve. **Vanity,** emptiness, conceit, self-conceit, affectedness. **Vapid,** dull, flat, insipid, stale, tame. (Sparkling.) **Vapor, fume,**

smoke, mist, fog, steam. **Variable**, changeable, unsteady, inconstant, shifting, wavering, fickle, restless, fitful. (Constant.) **Variety**, difference, diversity, change, diversification, mixture, medley, miscellany. (Sameness, monotony.) **Vast**, spacious, boundless, mighty, enormous, immense, colossal, gigantic, huge, prodigious. (Confined.) **Vaunt**, boast, brag, puff, hawk, advertise, flourish, parade. **Venerable**, grave, sage, wise, old, reverend. **Venial**, pardonable, excusable, justifiable. (Grave, serious.) **Venom**, poison, virus, spite, malice, malignity. **Venture**, *n.*, speculation, chance, peril, stake. **Venture**, *v.*, dare, adventure, risk, hazard, jeopardize. **Veracity**, truth, truthfulness, credibility, accuracy. (Falsehood.) **Verbal**, oral, spoken, literal, parole, unwritten. **Verdict**, judgment, finding, decision, answer. **Vexation**, chagrin, mortification. (Pleasure.) **Vibrate**, oscillate, swing, sway, wave, undulate, thrill. **Vice**, vileness, corruption, depravity, pollution, immorality, wickedness, guilt, iniquity, crime. (Virtue.) **Vicious**, corrupt, depraved, debased, bad, contrary, unruly, demoralized, profligate, faulty. (Virtuous, gentle.) **Victim**, sacrifice, food, prey, sufferer, dupe, gull. **Victuals**, viands, bread, meat, provisions, fare, food, repast. **View**, prospect, survey. **Violent**, boisterous, furious, impetuous, vehement. (Gentle.) **Virtuous**, upright, honest, moral. (Profligate.) **Vision**, apparition, ghost, phantom, spectre. **Voluptuary**, epicure, sensualist. **Vote**, suffrage, voice. **Vouch**, affirm, asseverate, assure, aver.

WAIT, await, expect, look for, wait for. **Wakeful**, vigilant, watchful. (Sleepy.) **Wander**, range, ramble, roam, rove, stroll. **Want**, lack, need. (Abundance.) **Wary**, circumspect, cautious. (Foolhardy.) **Wash**, clean, rinse, wet, moisten, stain, tint. **Waste**, *v.*, squander, dissipate, lavish, destroy, decay, dwindle, wither. **Wasteful**, extravagant, profligate. (Economical.) **Way**, method, plan, system, means, manner, mode, form, fashion, course, process, road, route, track, path, habit, practice. **Wave**, breaker, billow, surge. **Weak**, feeble, infirm. (Strong.) **Weaken**, debilitate, enfeeble, enervate, invalidate. (Strengthen.) **Wearisome**, tedious, tiresome. (Interesting, entertaining.) **Weary**, harass, jade, tire, fatigue. (Refresh.) **Weight**, gravity, heaviness. (Lightness.) **Weight**, burden, load. **Well-being**, happiness, prosperity, welfare. **Whole**, entire, complete, total, integral. (Part.) **Wicked**, iniquitous, nefarious. (Virtuous.) **Will**, wish, desire. **Willingly**, spontaneously, voluntarily. (Unwillingly.) **Win**, get, obtain, gain, procure, effect, realize, accomplish, achieve. (Lose.) **Winning**, attractive, charming, fascinating, bewitching, enchanting, dazzling, brilliant. (Repulsive.) **Wisdom**, prudence, foresight, far-sightedness, sagacity. (Foolishness.) **Wit**, humor, satire, fun, raillery. **Wonder**, *v.*, admire, amaze, astonish, surprise. **Wonder**, *n.*, marvel, miracle, prodigy. **Word**, *n.*, expression, term. **Work**, labor, task, toil. (Play.) **Worthless**, valueless. (Valuable.) **Writer**, author, penman. **Wrong**, injustice, injury. (Right.)

YAWN, gape, open wide. **Yearn**, hanker after, long for, desire, crave. **Yell**, bellow, cry out, scream. **Yellow**, golden, saffron-like. **Yelp**, bark, sharp cry, howl. **Yet**, besides, nevertheless, notwithstanding, however, still, ultimately, at last, so far, thus far. **Yield**, bear, give, afford, impart, communicate, confer, bestow, abdicate, resign, cede, surrender, relinquish, relax, quit, forego, give up, let go, waive, comply, accede, assent, acquiesce, succumb, submit. **Yielding**, supple, pliant, bending, compliant, submissive, unresisting. (Obstinate.) **Yoke**, *v.*, couple, link, connect. **Yore**, long ago, long since. **Young**, juvenile, inexperienced, ignorant, youthful. **Youth**, boy, lad, minority, adolescence, juvenility. **Youthful**, young, juvenile, boyish, girlish, puerile. (Old.)

ZEAL, energy, fervor, ardor, earnestness, enthusiasm, eagerness. (Indifference.) **Zealous**, warm, ardent, fervent, enthusiastic, anxious. (Indifferent, careless.) **Zest**, relish, gusto, flavor. (Disgust.)

LEAD in the form of filings, under a pressure of 2,000 atmospheres, or thirteen tons to the square inch, becomes compressed into a solid block, in which it is impossible to detect the slightest vestige of the original grains. Under a pressure of 5,000 atmospheres it liquifies.

THE WORLD AND THE UNIVERSE.

Facts Astronomical, Geographical, Historical and Statistical.

ACCORDING to the System of Copernicus (*b.* 1473), the Sun was regarded as the center of the universe. The planets, Mercury, Venus, the Earth, Mars, Jupiter, and Saturn, revolved round it in circular orbits; the Moon was a satellite of the Earth, spun round it as a center, and accompanied it on its annual rotation round the Sun. Since then this view has been firmly established in its main principles, but it is now known that the Sun itself moves steadily toward the constellation Hercules, and that it is by no means the largest body in the universe. The Solar System is known to consist of a central Sun, round which all the other members revolve. These consist of eight *primary* planets, viz.: Mercury, Venus, the Earth, Mars, Jupiter, Saturn, Uranus, and Neptune; twenty *secondary* planets, *satellites*, or attendants upon the planets, of which the Earth has one, Mars two, Jupiter four, Saturn eight, Uranus four, and Neptune one; a number of minor planets or *asteroids* situated between Mars and Jupiter, of which 271 are known; several comets, and a great number of small meteoric bodies.

In their broad general features the planets are all alike. The ball or globe-like form is peculiar to all of them, they are all dark bodies, deriving light and heat from the sun, and consequently they all reflect the same borrowed light. In common, they all perform two motions, the one a spinning or rotatory motion on an axis, the other a motion of translation, which whirls them round the sun. Both these motions are from west to east, and the orbits which they describe round the sun are not circular, as represented by the Copernican System, but assume more the form of an oval or *ellipse*.

SOME ELEMENTS OF THE PLANETARY SYSTEM.

Names of the Planets.	Diameter in miles.	Periodic time. Days.	Dis. from the Sun. Miles.	Revolves on its Axis.	Moves in its Orbit per hour.
Mercury	3,200	88	37 Mill.	24 h. 5 m	110,000 Miles
Venus . .	7,700	224.7	69 "	23 h. 21 m	83,000 "
Earth . . .	7,916	365¼	95 "	23 h. 56 m	68,000 "
Mars . . .	4,200	687	145 "	24 h. 39 m	54,000 "
Jupiter . .	88,000	4,332½	494 "	9 h. 56 m	30,000 "
Saturn . .	75,000	10,759	906 "	10 h. 29 m	22,000 "
Uranus	35,000	30,687	1,822 "	Unknown	15,000 "
Neptune	38,000	60,127	2,853 "	"	12,000 "
Moon . . .	2,180	Dist. from Earth, 238,000 miles.			2,280 "
Sun	887,000	1,400,000 times larger than Earth			Unknown.

The circumference of the earth is measured in this way: Suppose two astronomers, A and B, stationed on the same meridian, a certain distance apart, and with accurate instruments, should make careful observations on a certain star at the moment it crossed the meridian; and A should find the star 16 degrees south of the zenith, and B, who is exactly 415 miles south of A, should find it only 10 degrees south of the zenith; there would then be a difference of 6 degrees between the two places; and as they are 415 miles apart, *one* degree must be 1-6th of 415 or 69 1-6th miles.

Now, if 1 degree, which is the 360th part of the earth's circumference, is 69 1-6th miles, the whole circumference must be 360 times 69 1-6th, or 24,900 miles.

It is in this manner that the earth's magnitude is computed very accurately.

THE NEBULAR HYPOTHESIS, now generally accepted by scientists as explaining, as far as possible by human conception, the genesis of the heavenly bodies, was first suggested by Herschel, and developed by Laplace. It assumes that the solar system was once an enormous mass of gaseous substance. Rapid rotation being set up in this gaseous mass, it took the form of a disc, and at last, centrifugal force overcoming cohesion, whole rings and fragments flew off from this disc, and by centripetal force contracted into spheroid masses. As in the original mass, the velocity of the outer circle of each body thrown off is greater than the inner circle, and this causes each spheroid to revolve on its own axis. This process goes on, and the central mass continues to cool and shrink, until we have at last a central body with a number of smaller spheroidal bodies revolving around it in orbits the smaller the nearer they are to the central orb. Certain points are assumed in this hypothesis to explain the distribution of matter in our solar system. It is assumed that in the throwing off of great masses from the central disk, immense quantities of minute particles were also thrown, which continued to revolve, in the same plane with the large mass, around the center body. By slow degrees these minute atoms, by the law of gravitation, were aggregated into the mass nearest to them. These subordinate aggregations would form with most difficulty nearest the large central mass, because of the superior attractive force of the latter, wherefore the interior planets—Mercury, Venus, the Earth, Mars—are smaller than the two great orbs in the zone beyond them. These two enormous planets, Jupiter and Saturn, occupy the space where conditions are most favorable to subordinate aggregations, but, beyond them, the gravity of aggregating material becomes reduced, and so the planets found in the

outer zone, Uranus and Neptune, are smaller than the planets of the middle zone.

Our Globe and Its Inhabitants.

The three primary divisions of man, as indicated by Latham, are the Indo-European, the Mongolian, and the African.

I. The Indo-European or Caucasic race originally extended from India across Europe, and increasing ever in civilization and intellectual power from age to age, has become the dominant one in the world, extending its influence to every part of the earth, supplanting many inferior races, and repeopling wide areas, as in America and Australia.

The Caucasic race comprises two principal branches—the Aryan and the Semitic. A third branch, according to M. de Quatrefages, includes the Caucasians proper, Euscarians (Basques), and others.

Most of the inhabitants of Europe belong to the Aryan Family; they are arranged in the following groups:

1. The Keltic, in the N. W., comprising the Welsh, Gaels, Erse, Manx, and Armoricans.
2. The Italic, chiefly in the S. W. and S., comprising the Italians and other Romance nations—French, Spanish, Portuguese, Roumanesch, and Roumanians.
3. The Thraco-Hellenic, in the S. E., Greeks and Albanians.
4. The Teutonic, in the N. N. W., and center, comprising the Germans, Scandinavians, Danes, Icelanders, Dutch, Flemings, English.
5. The Lithuanian, S. E. of the Baltic.
6. The Slavonic, in the E., comprising the Russians, Poles, Tsekhs, Serbs, Croats, Bulgarians, etc.

The Indo European or Caucasic race in Asia comprises the Hindus, Baluchis, Afghans, Iranians (Persia), Galchas (Zarafshan), and the Semitic tribes of Armenia, Syria, Arabia, etc.

II. The Mongolian is divisible into three branches, according to geographical position, which again form numerous smaller families.

1. The Asiatic, comprising the Mongolians of the Chinese Empire, India, and Indo-China; the Kalmucks, adjoining the Turks, who extend from Southern Europe far into Central Asia; The Magyars of Hungary; the Yakuts and Samoeids (or Samoyedes) of Siberia; with the Lapps, Finns, and various tribes of East Europe.
2. The Oceanic Mongolians are composed of two classes. I. The black-skinned, found in New Guinea, Australia, Tasmania, and the islands between New Zealand and New Caledonia. II. The yellow, olive or brown race, occupying New Zealand, the Malay Peninsula, Sumatra, Borneo, Java, Moluccas, Philippines, Madagascar, etc.
3. The American Mongolians comprise a large number of tribes, the chief of which in North America are—the Athabaskans, Algonkins, Sioux, Paducas, and Mexicans. In South America the Quichuas, Chilians, and Patagonians extend along the west coast. The Caribs, Maypures, Brazilians, Moxos, and Chiquitos occupy the north, east, and center of the continent. The Eskimos form a connecting link between the Asiatic and American branches of this family.

III. The African, forming the third great division of the human race, is exhibited in its purest form by the natives of Western Africa. The Negroes occupy the whole central portion of the country from Cape Verd on the west to Khartoom on the east, and south to the Congo. South of the Negros are the Bantus (including the Kafirs), inhabiting the greater part of Africa between the 4th parallel of N. lat. and the Cape. In the S. W. are the Hottentots. Certain dwarfish tribes are found in different parts of the continent, as the Bushmen of the Kalahari Desert, the Obongo of the Ogowe basin, and others. The Fulas and Nubas occupy parts of the Soudan; the former, in the N. W., extend from the Senegal and Niger towards Lake Tchad; the latter are found in Nubia, Kordofan, Darfur, etc. The Gallas, Copts, Somali, of the Sahara, Egypt, and East Africa; the Abyssinians; and the Berbers, Kabyles, Tuareks and other tribes of North Africa, belong to the Hamitic race, which is closely allied to the Semitic race. The latter is represented by the Arabs of the N. coast, and of the Arabian Peninsula, and by the Tigres and other tribes or Abyssinia.

Countries.	Population.	Sq. Miles.	Capitals.	Governm't.
China	403,000,000	4,469,200	Pekin	Abs. Desp
British Empire	320,676,000	9,079,711	London	Lim. Mon
Russian Empire	102,970,000	8,644,100	St. Petersburg	Abs. Mon
France and Colonies	63,672,048	970,477	Paris	Republic
United States	*62,622,250	3,602,990	Washington	Republic
German Empire	46,852,450	212,028	Berlin	Lim. Mon
Austro-Hung. Empire	39,206,052	261,591	Vienna	Lim. Mon
Japan	36,700,118	147,669	Tokio	Lim. Mon
Holland and Colonies	33,042,238	778,187	The Hague	Lim. Mon
Turkish Empire	32,000,000	1,731,280	Constantinople	Abs. Mon
Italy	29,699,785	111,410	Rome	Lim. Mon
Spain and Colonies	24,873,621	361,953	Madrid	Lim. Mon
Sokoto	12,600,000	178,000	Sokoto	Abs. Desp
Corea	10,519,000	91,430	Seul	Abs. Desp
Brazil	10,200,000	3,219,000	Rio de Janeiro	Lim. Mon
Mexico	10,007,000	751,177	Mexico	Republic
Congo Free State	8,000,000	.....	.....	Free State
Persia	7,653,600	636,000	Teheran	Abs. Desp
Portugal and Colonies	7,249,050	240,691	Lisbon	Lim Mon
Egypt†	6,806,381	494,000	Cairo	Abs. Mon
Sweden and Norway	6,554,448	295,714	Stockholm	Lim. Mon
Morocco	6,500,000	314,000	Fez	Abs. Desp
Belgium	5,853,278	11,373	Brussels	Lim. Mon
Siam	5,700,000	280,550	Bangkok	Abs. Desp
Roumania†	5,376,000	46,314	Bucharest	Lim. Mon
Colombia	4,000,000	331,420	Bogota	Republic
Afghanistan	4,000,000	279,000	Cabul	Abs. Desp
Argentine Republic	3,026,000	609,386	Buenos Ayres	Republic
Madagascar	3,000,000	228,570	Antananarivo	Abs. Desp
Abyssinia	3,000,000	128,000	.....	Abs. Desp
Saxony‡	2,972,805	5,789	Dresden	Lim. Mon
Peru	2,970,000	405,040	Lima	Republic
Switzerland	2,906,752	15,981	Berne	Republic
Bolivia	2,325,000	481,600	La Paz	Republic
Bokhara	2,130,000	92,300	Samarcand	Abs. Desp
Venezuela	2,121,988	566,159	Caracas	Republic
Chili	2,115,340	307,525	Santiago	Republic
Denmark	2,045,179	14,842	Copenhagen	Lim. Mon
Bulgaria†	2,007,919	24,700	Sofia	Lim. Mon
Greece	1,979,453	24,977	Athens	Lim. Mon
Wurtemberg‡	1,971,118	7,531	Stuttgart	Lim. Mon
Servia	1,820,000	18,757	Belgrade	Lim. Mon
Oman	1,600,000	81,000	Muscat	Abs. Mon
Guatemala	1,278,311	46,774	New Guatemala	Republic
Ecuador	1,146,000	248,370	Quito	Republic
Tripoli†	1,010,000	399,000	Tripoli	Abs. Mon
Transvaal	800,000	110,193	Pretoria	Republic
Salvador	554,000	7,228	San Salvador	Republic
Uruguay	520,536	72,112	Montevideo	Republic
Paraguay	476,000	92,000	Asuncion	Republic
Honduras	458,000	42,658	Tegucigalpa	Republic
Nicaragua	400,000	51,660	Managua	Republic
Dominican Republic	300,000	20,596	San Domingo	Republic
Montenegro	245,380	3,486	Cetigno	Abs. Mon
Costa Rica	180,000	19,985	San José	Republic
Orange Free State	133,518	41,484	Bloemfontein	Republic
Hayti	93,200	29,830	Port-au-Prince	Republic
Hawaii	66,097	6,587	Honolulu	Lim. Mon

* Official census, 1890. † Also enumerated with the Turkish Empire. ‡ Included in German Empire.

THE CENSUS OF 1890.

THE POPULATION OF THE UNITED STATES—OFFICIAL TABULATION.

The population of the United States on June 1, 1890, as shown by the official count, completed in 1891, exclusive of white persons in the Indian Territory, Indians on reservations, and Alaska, was 62,622,250. The following comparative table gives the figures for each State. The black figures after the name of the State show that State's rank as regards population. New York still heads the list, as in 1880, and is followed by Pennsylvania. Illinois changes places with Ohio, and is now third. Of the other changes in the list the most marked are those of Texas, which rises from No. 11 to No. 7; Kentucky, which drops from 8 to 11; Minnesota, which rises from 26 to 20; Nebraska, which rises from 30 to 26; Maryland, which drops from 23 to 27; Colorado, which rises from 35 to 31; Vermont, which drops from 32 to 36; Washington, which rises from 42 to 34; Delaware, which drops from 38 to 42; Nevada, which drops from 43 to 49, and Arizona, which drops from 44 to 48.

STATES AND TERRITORIES.	POPULATION.			INCREASE FROM 1880 TO 1890.	INCREASE FROM 1870 TO 1880.
	1890.	1880.	1870.	Percentage.	Percentage.
The United States....	62,622,250	50,155,783	38,558,371	24.86	30.08
North Atlantic Div...	17,401,545	14,507,407	12,298,730	19.95	17.96
Maine.....30	661,086	648,936	626,915	1.87	3.51
New Hampshire....33	376,530	346,991	318,300	8.51	9.01
Vermont.....36	332,422	332,286	330,551	0.04	0.52
Massachusetts..... 6	2,238,943	1,783,085	1,457,351	25.57	22.35
Rhode Island.....35	345,506	276,531	217,353	24.94	27.23
Connecticut.....29	746,258	622,700	537,454	19.84	15.86
New York 1	5,997,853	5,082,871	4,382,759	18.00	15.97
New Jersey.....18	1,444,933	1,131,116	906,096	27.74	24.83
Pennsylvania..... 2	5,258,014	4,282,891	3,521,951	22.77	21.61
South Atlantic Div ...	8,857,920	7,597,197	5,853,610	16.59	29.79
Delaware.....42	168,493	146,608	125,015	14.93	17.27
Maryland 27	1,042,390	934,943	780,894	11.49	19.73
District of Columbia.39	230,392	177,624	131,700	29.71	34.87
Virginia 15	1,655,980	1,512,565	1,225,163	9.48	23.46
West Virginia.....28	762,794	618,457	442,014	23.34	39.92
North Carolina.....16	1,617,947	1,399,750	1,071,361	15.59	30.65
South Carolina.....23	1,151,149	995,577	705,606	15.63	41.10
Georgia.....12	1,837,353	1,542,180	1,184 109	19.14	30.24
Florida... 32	391,422	269,493	187,748	45.24	43.54

POPULATION OF THE UNITED STATES.—(*Continued.*)

STATES AND TERRITORIES.	POPULATION.			INCREASE FROM 1880 TO 1890.	INCREASE FROM 1870 TO 1880.
	1890.	1880.	1870.	Percentage.	Percentage.
Northern Central Div.	22,362,279	17,364,111	12,981,111	28.78	33.76
Ohio 4	3,672,316	3,198,062	2,665,260	14.83	19.99
Indiana 8	2,192,404	1,978,301	1,680,637	10.82	17.71
Illinois 3	3,826,351	3,077,871	2,539,891	24.32	21.18
Michigan 9	2,093,889	1,636,937	1,184,059	27.92	38.25
Wisconsin 14	1,686,880	1,315,497	1,054,670	28.23	24.73
Minnesota 20	1,301,826	780,773	439,706	66.74	77.57
Iowa 10	1,911,896	1,624,615	1,194,020	17.68	36.06
Missouri 5	2,679,184	2,168,380	1,721,295	23.56	25.97
North Dakota 41	182,719	36,909	14,181	395.05	853.23
South Dakota 37	328,808	98,268		234.60	
Nebraska 26	1,058,910	452,402	122,993	134.06	267.83
Kansas 19	1,427,096	996,096	364,399	43.27	173.35
Southern Central Div.	10,972,893	8,919,371	6,434,410	23.02	38.62
Kentucky 11	1,858,635	1,648,690	1,321,011	12.73	24.81
Tennessee 13	1,767,518	1,542,359	1,258,520	14.60	22.55
Alabama 17	1,513,017	1,262,505	996,992	19.84	26.63
Mississippi 21	1,289,600	1,131,597	827,922	13.96	36.68
Louisiana 25	1,118,587	939,946	726,915	19.01	29.31
Texas 7	2,235 523	1,591,749	818,579	40.44	94.45
Indian Territory (*b*)..	.....	.....	.....	.....	.....
Oklahoma 46	*c*61,834	.....	.....	.....	.....
Arkansas 24	1,128,179	802,525	484,471	40.58	65.65
Western Div.	3,027,613	1,767,697	990,510	71.27	78.46
Montana 44	132,159	39,159	20,595	237.49	90.14
Wyoming 47	60,705	20,789	9,118	192.01	128.00
Colorado 31	412,198	194,327	39,864	112.12	387.47
New Mexico 43	153,593	119,565	91,874	28.46	30.14
Arizona 48	59,620	40,440	9,658	47.43	318.72
Utah 40	207,905	143,963	86,786	44.42	65.88
Nevada 49	45,761	62,266	42,491	*a*26.51	46.54
Idaho 45	84,385	32,610	14,999	158.77	117.41
Alaska (*d*)	.....	.....	.....	.....	.....
Washington 34	349,390	75,116	23,955	365.13	213.57
Oregon 38	313,767	174,768	90,923	79.53	92.22
California 22	1,208,130	864,694	560,247	39.72	54.34

a Decrease.

b The number of white persons in the Indian Territory is not included in this table. The total Indian population of the United States, exclusive of Alaska, but including 32,567 counted in the general census, being the taxed or taxable Indians, numbers 249,273.

c Including 5,337 persons in Greer County (in Indian Territory) claimed by Texas.

d The number of white persons in Alaska is not included in this table, as the census of Alaska, which was made a subject of special investigation by law, has not yet been completed.

POPULATION OF CITIES.

Fifty Principal Cities of the United States in 1890.

In the Order of their Rank.

CITIES.	1890.	1880.	CITIES.	1890.	1880.
New York, N. Y	1,515,301	1,206,299	Denver, Colo	106,713	35,629
Chicago, Ill	1,099,850	503,185	Indianapolis, Ind	105,436	75,056
Philadelphia, Pa	1,046,964	847,170	Allegheny, Pa	105,287	78,682
Brooklyn, N. Y.	806,343	566,663	Albany, N. Y	94,923	90,758
St. Louis, Mo	451,770	350,518	Columbus, Ohio	88,150	51,647
Boston, Mass	448,477	362,839	Syracuse, N. Y	88,143	51,792
Baltimore, Md	434,439	332,313	Worcester, Mass	84,655	58,291
San Francisco, Cal	298,997	233,959	Toledo, Ohio	81,434	50,137
Cincinnati, Ohio	296,908	255,139	Richmond, Va	81,388	63,600
Cleveland, Ohio	261,353	160,146	New Haven, Conn	81,298	62,882
Buffalo, N. Y	255,664	155,134	Paterson, N. J	78,347	51,031
New Orleans, La	242,039	216,090	Lowell, Mass	77,696	59,475
Pittsburg, Pa	238,017	156,389	Nashville, Tenn	76,168	43,350
Washington, D. C	230,392	177,624	Scranton, Pa	75,215	45,850
Detroit, Mich	205,876	116,340	Fall River, Mass	74,398	48,961
Milwaukee, Wis	204,468	115,587	Cambridge, Mass	70,028	52,669
Newark, N. J	181,830	136,508	Atlanta, Ga	65,533	37,409
Minneapolis, Minn	164,738	46,887	Memphis, Tenn	64,495	33,592
Jersey City, N. J	163,003	120,722	Wilmington, Del	61,431	42,478
Louisville, Ky	161,129	123,758	Dayton, Ohio	61,220	38,678
Omaha, Neb	140,452	30,518	Troy, N. Y	60,956	56,747
Rochester, N. Y	133,896	89,366	Grand Rapids, Mich.	60,278	32,016
Saint Paul, Minn	133,156	41,473	Reading, Pa	58,661	43,278
Kansas City, Mo	*132,716	55,785	Camden, N. J	58,313	41,659
Providence, R. I	132,146	104,857	Trenton, N. J	57,458	29,910

Cities and Towns of 8,000 and over in 1890.

Arranged Alphabetically and Compared with the Census of 1880.

CITIES AND TOWNS.	1890.	1880.	CITIES AND TOWNS.	1890.	1880.
Adams, Mass	9,213	5,591	Athens, Ga	8,639	6,099
Adrian, Mich	8,756	7,849	Atlanta, Ga	65,533	37,409
Akron, Ohio	27,601	16,512	Atlantic City, N. J	13,055	5,477
Alameda, Cal	11,165	5,708	Auburn, Me	11,250	9,555
Albany, N. Y	94,923	90,758	Auburn, N. Y	25,858	21,924
Alexandria, Va	14,339	13,659	Augusta, Ga	33,300	21,891
Allegheny, Pa	105,287	78,682	Augusta, Me	10,527	8,665
Allentown, Pa	25,228	18,063	Aurora, Ill	19,688	11,873
Alpena, Mich	11,283	6,153	Austin, Texas	14,476	11,013
Alton, Ill	10,294	8,975	Baltimore, Md	434,439	332,313
Altoona, Pa	30,337	19,710	Bangor, Me	19,103	16,856
Amesbury, Mass	9,798	3,355	Bath, Me	8,723	7,874
Amsterdam, N. Y	17,336	9,466	Baton Rouge, La	10,478	7,197
Anderson, Ind	10,741	4,126	Battle Creek, Mich	13,197	7,063
Ann Arbor, Mich	9,431	8,061	Bay City, Mich	27,839	20,693
Anniston, Ala	9,876	942	Bayonne, N. J	19,033	9,372
Appleton, Wis	11,869	8,005	Beatrice, Neb	13,836	2,447
Arkansas City, Kans.	8,347	1,012	Beaver Falls, Pa	9,735	5,104
Asheville, N. C	10,235	2,616	Bellaire, Ohio	9,934	8,025
Ashland, Wis	9,956	.....	Belleville, Ill	15,361	10,683
Ashtabula, Ohio	8,338	4,445	Beverly, Mass	10,821	8,456
Atchison, Kans	13,963	15,105	Biddeford, Me	14,443	12,651

* Includes 13,048 which, by a recent decision of Missouri Supreme Court, is now outside the limits.

Cities and Towns of over 8,000 Population — Continued.

CITIES AND TOWNS.	1890.	1880.	CITIES AND TOWNS.	1890.	1880.
Binghamton, N. Y...	35,005	17,317	Denver, Colo..... ...	106,713	35,629
Birmingham, Ala.....	26,178	3,086	Des Moines, Iowa....	50,093	22,408
Bloomington, Ill.....	20,048	17,180	Detroit, Mich.....	205,876	116,340
Boston, Mass.....	448,477	362,839	Dover, N. H.....	12,790	11,687
Braddock, Pa.....	8,561	3,310	Dubuque, Iowa.....	30,311	22,254
Bradford, Pa.....	10,514	9,197	Duluth, Minn.....	33,115	3,483
Bridgeport, Conn.....	48,866	27,643	Dunkirk, N. Y.....	9,416	7,248
Bridgeton, N. J.....	11,424	8,722	Dunmore, Pa	8,315	5,151
Brockton, Mass.....	27,294	13,608	East Liverpool, Ohio.	10,956	5,568
Brookline, Mass	12,103	8,057	Easton, Pa.....	14,481	11,924
Brooklyn, N. Y.....	806,343	566,663	East Portland, Ore...	10,532	2,934
Brunswick, Ga.....	8,459	2,891	East Providence, R. I	8,422	5,056
Buffalo, N. Y.... ...	255,664	155,134	East St. Louis, Ill....	15,169	9,185
Burlington, Iowa.....	22,565	19,450	Eau Claire, Wis.....	17,415	10,119
Burlington, N. J.....	8,222	6,090	Elgin, Ill.....	17,823	8,787
Burlington, Vt.....	14,590	11,365	Elizabeth City, N. J..	37,764	28,229
Butler, Pa.....	8,734	3,163	Elkhart, Ind.....	11,360	6,953
Butte, Mont.....	10,723	3,363	Elmira. N. Y.....	29,708	20,541
Cairo, Ill.....	10,324	9,011	El Paso, Texas.....	10,338	736
Cambridge, Mass....	70,028	52,669	Erie, Pa.....	40,634	27,737
Camden, N. J.....	58,313	41,659	Evansville, Ind.....	50,756	29,280
Canton, Ohio	26,189	12,258	Everett, Mass.....	11,068	4,159
Carbondale, Pa.....	10,833	7,714	Fall River, Mass.....	74,398	48,961
Cedar Rapids, Iowa..	18,020	10,104	Findlay, Ohio.....	18,553	4,633
Charlston, S. C.....	54,955	49,984	Fitchburg, Mass.....	22,037	12,429
Charlotte, N. C.....	11,557	7,094	Flint, Mich.....	9,803	8,409
Chattanooga, Tenn...	29,100	12,892	Flushing, N. Y.....	10,868	*a* 6,683
Chicago, Ill.....	1,099,850	503,185	Fond du Lac, Wis....	12,024	13,094
Chicopee, Mass	14,050	11,286	Fort Scott, Kans.....	11,946	5,372
Chillicothe, Ohio.....	11,288	10,938	Fort Smith, Ark.....	11,311	3,099
Chippewa Falls, Wis.	8,670	3,982	Fort Wayne, Ind.....	35,393	26,880
Chelsea, Mass.....	27,909	21,782	Fort Worth, Texas...	23,076	6,663
Chester, Pa.....	20,226	14,997	Framingham, Mass...	9,239	6,235
Cheyenne, Wyo.....	11,690	3,456	Frederick, Md	8,193	8,659
Cincinnati, Ohio.....	296,908	255,139	Freeport, Ill.....	10,189	8,516
Cleveland, Ohio.....	261,353	160,146	Fresno, Cal.....	10,818	1,112
Clinton, Iowa	13,619	9,052	Galesburg, Ill.....	15,264	11,437
Clinton, Mass.....	10,424	8,029	Galveston, Texas	29,084	22,248
Cohoes, N. Y.....	22,509	19,416	Gardner, Mass.....	8,424	4,988
Colorado Spr'gs, Colo	11,140	4,226	Gloucester, Mass. ...	24,651	19,329
Columbia, Pa.....	10,599	8,312	Gloversville, N. Y....	13,864	7,133
Columbia, S. C.....	15,353	10,036	Grand Rapids, Mich.	60,278	32,016
Columbus, Ga.....	17,303	10,123	Green Bay, Wis.....	9,069	7,464
Columbus, Ohio.....	88,150	51,647	Greenville, S. C.....	8,607	6,160
Concord, N. H.....	17,004	13,843	Greenwich, Conn.....	10,131	7,892
Corning, N. Y.....	8,550	4,802	Hagerstown, Md.....	10,118	6,627
Council Bluffs, Iowa..	21,474	18,063	Hamilton, Ohio	17,565	12,122
Covington, Ky	37,371	29,720	Hannibal, Mo.....	12,857	11,074
Cranston, R. I.....	8,099	5,940	Harrisburg, Pa..	39,385	30,762
Cumberland, Md.....	12,729	10,693	Harrison, N J.....	8,338	6,898
Cumberland, R. I....	8,090	6,445	Hartford, Conn.....	53,230	42,015
Dallas, Texas.....	38,067	10,358	Hastings, Neb.....	13,584	2,817
Danbury, Conn.....	16,552	11,666	Haverhill, Mass.....	27,412	18,472
Danville, Ill.....	11,491	7,733	Hazelton, Pa...	11,872	6,935
Danville, Va.....	10,305	7,526	Helena, Mont.....	13,834	3,624
Davenport, Iowa.....	26,872	21,831	Henderson, Ky.....	8,835	5,365
Dayton, Ohio.....	61,220	38,678	Hoboken, N. J.....	43,048	30,999
Decatur, Ill.....	19,841	9,547	Holyoke, Mass.....	35,637	21,915
Delaware, Ohio.....	8,224	6,894	Hornellsville, N. Y...	10,996	8,195
Denison, Texas.....	10,958	3,975	Hot Springs, Ark.....	8,086	3,554

Cities and Towns of over 8,000 Population — Continued.

CITIES AND TOWNS.	1890.	1880.	CITIES AND TOWNS.	1890.	1880.
Houston, Texas	27,557	16,513	Macon, Ga.	22,746	12,749
Hudson, N. Y	9,970	8,670	Madison, Ind.	8,937	8,945
Huntington, W. Va	10,108	3,174	Madison, Wis.	13,426	10,324
Hutchinson, Kans.	8,682	1,540	Mahanoy, Pa.	11,286	7,181
Hyde Park, Mass.	10,193	7,088	Malden, Mass.	23,031	12,017
Indianapolis, Ind	105,436	75,056	Manchester, Conn.	8,222	6,462
Ironton, Ohio	10,939	8,857	Manchester, N. H.	44,126	32,630
Iron Mountain, Mich.	8,599	.....	Manchester, Va.	9,246	5,729
Ishpeming, Mich.	11,197	6,039	Manistee, Mich	12,812	6,930
Ithaca, N. Y.	11,079	9,105	Mankato, Minn.	8,838	5,550
Jackson, Mich.	20,798	16,105	Mansfield, Ohio.	13,473	9,859
Jackson, Tenn	10,039	5,377	Marblehead, Mass.	8,202	7,467
Jacksonville, Fla.	17,201	7,650	Marietta, Ohio.	8,273	5,444
Jacksonville, Ill.	10,740	10,927	Marinette, Wis.	11,523	2,750
Jamestown, N. Y.	16,038	9,357	Marion, Ind.	8,769	3,182
Janesville, Wis.	10,836	9,018	Marion, Ohio.	8,327	3,899
Jeffersonville, Ind.	10,666	9,357	Marlborough, Mass.	13,805	30,127
Jersey City, N. J.	163,003	120,722	Marquette, Mich.	9,093	4,690
Johnston, R. I.	9,778	5,765	Marshalltown, Iowa	8,914	6,240
Johnstown, Pa.	21,805	8,380	Massillon, Ohio.	10,092	6,836
Joliet, Ill.	23,264	11,657	Meadville, Pa.	9,520	8,860
Joplin, Mo.	9,943	7,038	Medford, Mass.	11,079	7,573
Kalamazoo, Mich.	17,853	11,937	Melrose, Mass.	8,519	4,560
Kankakee, Ill.	9,025	5,651	Memphis, Tenn.	64,495	33,592
Kansas City, Kans.	38,316	3,200	Menominee, Mich.	10,630	3,288
Kansas City, Mo.	132,716	55,785	Meriden, Conn.	21,652	15,540
Kearney, Neb.	8,074	1,782	Meridian, Miss.	10,624	4,008
Keokuk, Iowa	14,101	12,117	Michigan City, Ind.	10,776	7,366
Key West, Fla.	18,080	9,890	Middletown, Conn.	9,013	6,826
Kingston, N. Y.	21,261	18,344	Middletown, N. Y.	11,977	8,494
Knoxville, Tenn.	22,535	9,693	Milford, Mass.	8,780	9,316
Kokomo, Ind.	8,261	4,042	Millville, N. J.	10,002	7,660
La Crosse, Wis.	25,090	14,505	Milwaukee, Wis.	204,468	115,587
Lafayatte, Ind.	16,243	14,860	Minneapolis, Minn.	164,738	46,887
Lancaster, Pa.	32,011	25,769	Moberly, Mo.	8,215	6,070
Lansing, Mich.	13,102	8,319	Mobile, Ala.	31,076	29,132
Lansinburg, N. Y.	10,550	7,432	Moline, Ill.	12,000	7,800
Laredo, Texas.	11,319	3,521	Montgomery, Ala.	21,883	16,713
La Salle, Ill.	9,855	7,847	Mount Carmel, Pa.	8,254	2,378
Lawrence, Kans	9,997	8,510	Mount Vernon, N. Y.	10,677	4,586
Lawrence, Mass.	44,654	39,151	Muncie, Ind.	11,345	5,219
Leadville, Colo.	11,212	14,820	Muscatine, Iowa	11,454	8,295
Leavenworth, Kans.	19,768	16,546	Muskegon, Mich.	22,702	11,262
Lebanon, Pa.	14,664	8,778	Nanticoke, Pa.	10,044	3,884
Lewiston, Me	21,701	19,083	Nashua, N. H.	19,311	13,397
Lexington, Ky.	21,567	16,656	Nashville, Tenn	76,168	43,350
Lima, Ohio	15,987	7,567	Natchez, Miss.	10,101	7,058
Lincoln Neb	55,154	13,003	Natick, Mass.	9,118	8,479
Lincoln, R. I.	20,355	13,765	Nebraska City, Neb.	11,494	4,183
Little Falls, N. Y.	8,783	6,910	New Albany, Ind.	21,059	16,423
Little Rock, Ark.	25,874	13,138	Newark, N. J.	181,830	136,508
Lockport, N. Y.	16,038	13,522	Newark, Ohio.	14,270	9,600
Logansport, Ind.	13,328	11,198	New Bedford, Mass.	40,733	26,845
Long Island City, N.Y	30,506	17,129	New Brighton, N. Y.	16,423	12,679
Los Angeles, Cal.	50,395	11,183	New Britain, Conn.	19,007	11,800
Louisville Ky.	161,129	123,758	New Brunswick, N. J	18,603	17,166
Lowell Mass.	77,696	59,475	Newburg, N. Y	23,087	18,049
Lynchburg, Va.	19,709	15,959	Newburyport, Mass.	13,947	13,538
Lynn, Mass.	55,727	38,274	Newcastle, Pa.	11,600	8,418
McKeesport, Pa.	20,741	8,212	New Haven, Conn	81,298	62,882

Cities and Towns of over 8,000 Population — Continued.

CITIES AND TOWNS.	1890.	1880.	CITIES AND TOWNS.	1890.	1880.
New London, Conn...	13,757	10,537	Quincy, Mass.....	16,723	10,570
New Orleans, La.....	242,039	216,090	Racine, Wis.....	21,014	16,031
Newport, Ky.....	24,918	20,433	Raleigh, N. C.....	12,678	9,265
Newport, R. I.....	19,457	15,693	Reading, Pa.....	58,661	43,278
New Rochelle, N Y...	8,318	5,276	Richmond, Ind.....	16,608	12,742
Newton, Mass.....	24,379	16,995	Richmond, Va.....	81,388	63,600
New York, N. Y.....1,515,301		1,206,299	Roanoke, Va.....	16,159	.....
Norfolk, Va.....	34,871	21,966	Rochester, N. Y.....	133,896	89,366
Norristown, Pa.....	19,791	13,063	Rockford, Ill.....	23,584	13,129
North Adams, Mass..	16,074	10,191	Rock Island, Ill.....	13,634	11,659
Northampton, Mass..	14,990	12,172	Rockland, Me.....	8,174	7,599
Norwalk, Conn.....	17,747	13,956	Rome, N. Y.....	14,991	12,194
Norwich, Conn.....	16,156	15,112	Rutland, Vt.....	11,760	12,149
Oakland, Cal.....	48,682	34,555	Sacramento, Cal.....	26,386	21,420
Ogden, Utah.....	14,889	6,069	Saginaw, Mich.....	46,322	29,541
Ogdensburg, N. Y...	11,662	10,341	Saint Joseph, Mo....	52,324	32,431
Oil City, Pa.....	10,932	7,315	Saint Louis, Mo.....	451,770	350,518
Omaha, Neb.....	140,452	30,518	Saint Paul, Minn.....	133,156	41,473
Orange, N. J.....	18,844	13,207	Salem, Mass.....	30,801	27,563
Oshkosh, Wis.....	22,836	15,748	Salt Lake City, Utah.	44,843	20,768
Oswego, N. Y.....	21,842	21,116	San Antonio, Texas..	37,673	20,550
Ottawa City, Ill.....	9,985	7,834	San Diego, Cal.....	16,159	2,637
Ottumwa, Iowa	14,001	9,004	Sandusky, Ohio.....	18,471	15,838
Owensborough, Ky...	9,837	6,231	San Francisco, Cal...	298,997	233,959
Paducah, Ky.....	13,076	8,036	San Jose, Cal.....	18,060	12,567
Paris, Texas.....	8,254	3,980	Saratoga Spr'gs, N. Y	11,975	8,421
Parkersburg, W. Va..	8,408	6,582	Savannah, Ga.....	43,189	30,709
Passaic, N. J.....	13,028	6,532	Schenectady, N. Y...	19,902	13,655
Paterson, N. J.....	78,347	51,031	Scranton, Pa.....	75,215	45,850
Pawtucket, R. I.....	27,633	19,030	Seattle, Wash.....	42,837	3,553
Peabody, Mass.....	10,158	9,028	Sedalia, Mo.....	14,068	9,561
Peekskill, N. Y.....	9,676	6,893	Shamokin, Pa.....	14,403	8,184
Pensacola, Fla.....	11,750	6,845	Sheboygan, Wis.....	16,359	7,314
Peoria, Ill.....	41,024	29,259	Shenandoah, Pa	15,944	10,147
Perth Amboy, N. J...	9,512	4,808	Shreveport, La.....	11,979	8,009
Petersburg, Va.....	22,680	21,656	Sing Sing, N. Y.....	9,352	6,578
Philadelphia, Pa.....1,046,964		847,170	Sioux City, Iowa.....	37,806	7,366
Phillipsburg, N. J....	8,644	7,181	Sioux Falls, S. Dak..	10,177	2,164
Phœnixville, Pa	8,514	6,682	Somerville, Mass.....	40,152	24,933
Pine Bluff, Ark.....	9,952	3,203	South Bend, Ind.....	21,819	13,280
Piqua, Ohio.....	9,090	6,031	South Bethlehem, Pa.	10,302	4,925
Pittsburg, Pa.....	238,617	156,389	South Omaha, Neb...	8,062	.....
Pittsfield, Mass.....	17,281	13,364	Spencer, Mass.....	8,747	7,466
Pittston, Pa.....	10,302	7,472	Spokane Falls, Wash.	19,922	350
Plainfield, N. J.....	11,267	8,125	Springfield, Ill.....	24,963	19,743
Plattsmouth, Neb....	8,392	4,175	Springfield, Mass....	44,179	33,340
Plymouth, Pa.....	9,344	6,065	Springfield, Mo.....	21,850	6,522
Port Huron, Mich....	13,543	8,883	Springfield, Ohio.....	31,895	20,730
Port Jervis, N. Y.....	9,327	8,678	Stamford, Conn.....	15,700	11,297
Portland, Me.....	36,425	33,810	Steelton, Pa.....	9,250	2,447
Portland, Ore.....	46,385	17,577	Steubenville, Ohio....	13,394	12,093
Portsmouth, N. H....	9,827	9,690	Stillwater, Minn.....	11,260	9,055
Portsmouth, Ohio....	12,394	11,321	Stockton, Cal.....	14,424	10,282
Portsmouth, Va.....	13,268	11,390	Streator, Ill.....	11,414	5,157
Pottstown, Pa.....	13,285	5,305	Superior, Wis.....	11,983	.....
Pottsville, Pa.....	14,117	13,253	Syracuse, N Y.....	88,143	51,792
Poughkeepsie, N. Y..	22,206	20,207	Tacoma, Wash.....	36,006	1,098
Providence, R. I.....	132,146	104,857	Taunton, Mass.....	25,448	21,213
Pueblo, Colo.....	24,558	3,217	Terre Haute, Ind.....	30,217	26,042
Quincy, Ill.....	31,494	27,268	Tiffin, Ohio.....	10,801	7,879

Cities and Towns of over 8,000 Population — Concluded.

CITIES AND TOWNS.	1890.	1880.	CITIES AND TOWNS.	1890.	1880.
Titusville, Pa.....	8,073	9,046	Westfield, Mass.....	9,805	7,587
Toledo, Ohio.....	81,434	50,137	West Troy, N. Y.....	12,967	8,820
Topeka, Kans.....	31,007	15,452	Weymouth, Mass.....	10,866	10,570
Trenton, N. J.....	57,458	29,910	Wheeling, W. Va.....	35,013	30,737
Troy, N. Y.....	60,956	56,747	Wichita, Kans.....	23,853	4,911
Union, N. J.....	10,643	5,849	Wilkesbarre, Pa.....	37,718	23,339
Utica, N. Y.....	44,007	33,914	Williamsport, Pa.....	27,132	18,934
Vernon, Conn.....	8,808	6,915	Willimantic, Conn....	8,648	6,608
Vicksburg, Miss.....	13,373	11,814	Wilmington, Del.....	61,431	42,478
Vincennes, Ind.....	8,853	7,680	Wilmington, N. C....	20,056	17,350
Waco, Texas.....	14,445	7,295	Winona, Minn	18,208	10,208
Waltham, Mass.....	18,707	11,712	Winston, N. C.....	8,018	2,854
Warwick, R. I.....	17,761	12,164	Woburn, Mass.....	13,499	10,931
Washington, D. C....	230,392	177,624	Woonsocket, R. I....	20,830	16,050
Waterbury, Conn.....	38,646	17,806	Worcester, Mass.....	84,655	58,291
Watertown, N. Y.....	14,725	10,697	Yonkers, N. Y.....	32,033	18,892
Watertown, Wis.....	8,755	7,883	York, Pa.....	20,793	13,940
Wausau, Wis.....	9,253	4,277	Youngstown, Ohio...	33,220	15,435
West Bay City, Mich.	12,981	6,397	Zanesville, Ohio.....	21,009	18,113
West Chester, Pa.....	8,028	7,046			

The Wonderful Growth of Chicago.

The population of Chicago in 1830, was 70; 1840, 4,853; 1845, 12,088; 1850, 29,963; 1855, 60,227; 1860, 112,172; 1865, 178,900; 1870, 298,977; 1872, 364,377; 1880, 503,185; 1884, (estimated) 675,000; 1885, (estimated), 727,000; 1886, (estimated) 750,000; 1887, (estimated) 760,000; 1889, (estimated) 1,000,000; 1890, 1,099,133.

THE NAMES OF THE STATES.

Alabama—Indian; meaning "Here we rest." *Arkansas*—"Kansas," the Indian name for "smoky water," with the French prefix "arc," bow or bend in the principal river. *California*—*Caliente Fornalla*, Spanish for "hot furnace," in allusion to the climate. *Colorado*—Spanish; meaning "colored," from the red color of the Colorado river. *Connecticut*—Indian; meaning "long river." *Delaware*—Named in honor of Lord Delaware. *Florida*—Named by Ponce de Leon, who discovered it in 1512, on Easter Day, the Spanish *Pascua de Flores*, or "Feast of Flowers." *Georgia*—In honor of George II. of England. *Illinois*—From the Indian "illini," men, and the French suffix "ois," together signifying "tribe of men." *Indiana*—Indian land. *Iowa*—Indian; meaning "beautiful land." *Kansas*—Indian; meaning "smoky water." *Kentucky*—Indian; for "at the head of the river;" or "the dark and bloody ground." *Louisiana*—In honor of Louis XIV. of France. *Maine*—From the province of Maine, in France. *Maryland*—In honor of Henrietta Maria, queen of Charles I. of England. *Massachusetts*—The place of the great hills (the blue hills southwest of Boston).

Michigan—The Indian name for a fish weir. The lake was so called from the fancied resemblance of the lake to a fish trap. *Minnesota*—Indian; meaning "sky-tinted water." *Mississippi*—Indian; meaning "great father of waters." *Missouri*—Indian; meaning "muddy." *Nebraska*—Indian; meaning "water valley." *Nevada*—Spanish; meaning "snow-covered," alluding to the mountains. *New Hampshire*—From Hampshire county, England. *New Jersey*—In honor of Sir George Carteret, one of the original grantees, who had previously been governor of Jersey Island. *New York*—In honor of the Duke of York. *North and South Carolina*—Originally called Carolina, in honor of Charles IX. of France. *Ohio*—Indian; meaning "beautiful river." *Oregon*—From the Spanish "oregano," wild marjoram, which grows abundantly on the coast. *Pennsylvania*—Latin: meaning Penn's woody land. *Rhode Island*—From a fancied resemblance to the island of Rhodes in the Mediterranean. *Tennessee*—Indian, meaning "river with the great bend." *Texas*—Origin of this name is unknown. *Vermont*—French; meaning green mountain. *Virginia*—In honor of Elizabeth, the "Virgin Queen." *Wisconsin*—Indian; meaning "gathering of the waters," or "wild rushing channel."

MOTTOES OF THE STATES.

Arkansas—Regnant populi: The peoples rule. *California—Eureka:* I have found it. *Colorado—Nil sine numine:* Nothing without the Divinity. *Connecticut—Qui transtulit sustinet:* He who has transferred, sustains. *Delaware*—Liberty and Independence. *Florida*—In God is our trust. *Georgia*—Wisdom, Justice, Moderation. *Illinois*—State Sovereignty and National Union. *Iowa*—Our liberties we prize, and our rights we will maintain. *Kansas—Ad astra per aspera:* To the stars through rugged ways. *Kentucky*—United we stand, divided we fall. *Louisiana*—Union and Confidence. *Maine—Dirigo:* I direct. *Maryland—Crescite et multiplicamini:* Increase and multiply. *Massachusetts—Ense petit placidam sub libertate quietem:* By her sword she seeks under liberty a calm repose. *Michigan—Si quæris peninsulam amœnam circumspice:* If thou seekest a beautiful peninsula, look around. *Minnesota—L'Etoile du Nord:* The Star of the North. *Missouri—Solus populi suprema lex esto:* Let the welfare of the people be the supreme law. *Nebraska*—Popular Sovereignty. *Nevada—Volens et potens:* Willing and able. *New Jersey*—Liberty and Independence. *New York—Excelsior:* Higher. *Ohio—Imperium in imperio:* An empire within an empire. *Oregon—Alis volat propriis:* She flies with her own wings. *Pennsylvania*—Virtue, Liberty, Independence. *Rhode Island*—Hope.

South Carolina—Animis opibusque parati: Ready with our lives and property. *Tennessee*—Agriculture, Commerce. *Vermont*—Freedom and Unity. *Virginia—Sic semper tyrannis:* So be it ever to tyrants. *West Virginia—Montani semper liberi:* The mountaineers are always free. *Wisconsin*—Forward. *United States—E pluribus unum:* From many, one. *Annuit cœptis:* God has favored the undertaking; *Novus ordo seclorum:* A new order of ages. The first named on one side of the great seal, the other two on the reverse.

GEOGRAPHICAL NICKNAMES.

STATES AND TERRITORIES.

Alabama, Cotton State; Arkansas, Toothpick and Bear State; California, Eureka and Golden State; Colorado, Centennial State; Connecticut, Land of Steady Habits, Freestone State and Nutmeg State; Dakota, Sioux State; Delaware, Uncle Sam's Pocket Handkerchief and Blue Hen State; Florida, Everglade and Flowery State; Georgia, Empire State of the South; Idaho, Gem of the Mountains; Illinois, Prairie and Sucker State; Indiana, Hoosier State; Iowa, Hawkeye State; Kansas, Jayhawker State; Kentucky, Corn-cracker State; Louisiana, Creole State; Maine, Timber and Pine Tree State; Maryland, Monumental State; Massachusetts, Old Bay State; Michigan, Wolverine and Peninsular State; Minnesota, Gopher and North Star State; Mississippi, Eagle State; Missouri, Puke State; Nebraska, Antelope State; Nevada, Sage State; New Hampshire, Old Granite State; New Jersey, Blue State and New Spain; New Mexico, Vermin State; New York, Empire State; North Carolina, Rip Van Winkle, Old North and Turpentine State; Ohio, Buckeye State; Oregon, Pacific State; Pennsylvania, Keystone, Iron and Oil State; Rhode Island, Plantation State and Little Rhody; South Carolina, Palmetto State; Tennessee, Lion's Den State; Texas, Lone Star State; Utah, Mormon State; Vermont, Green Mountain State; Virginia, Old Dominion; Wisconsin, Badger and Copper State.

NATIVES OF STATES AND TERRITORIES.

Alabama, lizards; Arkansas, toothpicks; California, gold-hunters; Colorado, rovers; Connecticut, wooden nutmegs; Dakota, squatters; Delaware, muskrats; Florida, fly-up-the-creeks; Georgia, buzzards; Idaho, fortune seekers; Illinois, suckers; Indiana, hoosiers; Iowa, hawkeyes; Kansas, jayhawkers; Kentucky, corn-crackers; Louisiana, creoles; Maine, foxes; Maryland, clam-humpers; Massachusetts, Yankees; Michigan, wolverines; Minnesota, gophers; Mississippi, tadpoles; Missouri, pukes; Nebraska, bugeaters; Nevada, sage-hens; New Hampshire, granite boys; New Jersey, blues, or clam-catchers; New Mexico,

Spanish Indians; New York, Knickerbockers; North Carolina, tarheels; Ohio, buckeyes; Oregon, hard cases; Pennsylvania, pennamites, or leather-heads; Rhode Island, gunflints; South Carolina, weazles; Tennessee, whelps; Texas, beef-heads; Utah, polygamists; Vermont, green-mountain boys; Virginia, beagles; Wisconsin, badgers.

NICKNAMES OF CITIES.

Atlanta, Gate City of the South; Baltimore, Monumental City; Bangor, Lumber City; Boston, Modern Athens, Literary Emporium, City of Notions, and Hub of the Universe; Brooklyn, City of Churches; Buffalo, Queen of the Lakes; Burlington (Iowa), Orchard City; Charleston, Palmetto City; Chicago, Prairie, or Garden City; Cincinnati, Queen of the West and Porkopolis; Cleveland, Forest City; Denver, City of the Plains; Detroit, City of the Straits; Hartford, Insurance City; Indianapolis, Railroad City; Keokuk, Gate City; Lafayette, Star City; Leavenworth, Cottonwood City; Louisville, Falls City; Lowell, Spindle City; McGregor, Pocket City; Madison, Lake City; Milwaukee, Cream City; Nashville, Rock City; New Haven, Elm City; New Orleans, Crescent City; New York, Empire City, Commercial Emporium, Gotham, and Metropolis of America, Philadelphia, City of Brotherly Love, City of Penn, Quaker City, and Centennial City; Pittsburgh, Iron City and Smoky City; Portland (Me.), Hill City; Providence, Roger Williams's City, and Perry Davis's Pain Killer; Raleigh, Oak City; Richmond (Va.), Cockade City; Richmond (Ind.), Quaker City of the West; Rochester, Aqueduct City; Salt Lake City, Mormon City; San Francisco, Golden Gate; Savannah, Forest City of the South; Sheboyan, Evergreen City; St. Louis, Mound City; St. Paul, North Star City; Vicksburg, Key City; Washington, City of Magnificent Distances, and Federal City.

The English Sparrow.

The first English sparrow was brought to the United States in 1850, but it was not until 1870 that the species can be said to have firmly established itself. Since then it has taken possession of the country. Its fecundity is amazing. In the latitude of New York and southward it hatches, as a rule, five or six broods in a season, with from four to six young in a brood. Assuming the average annual product of a pair to be twenty-four young, of which half are females and half males, and assuming further, for the sake of computation, that all live, together with their offspring, it will be seen that in ten years the progeny of a single pair would be 275,716,983,698.

U. S. POLITICAL HISTORY IN BRIEF.

THAT enthusiastic little rebel, Rhode Island, was the first of the colonies to declare itself "free from all dependence on the crown of Great Britain." This she did on May 4, 1776. The Assembly of Virginia in the same month instructed her delegates to the Continental Congress to present to that body a proposition "affirming the independence of the colonies from Great Britain." In compliance with these instructions Richard Henry Lee, of Virginia, on June 7, 1776, introduced his famous resolutions: "That these united colonies are, and of right ought to be, free and independent States; that they are absolved from all allegiance to the British crown; and that all political connection between them and the state of Great Britain is, and ought to be, totally dissolved. That it is expedient forthwith to take the most effectual measures for forming foreign alliances. That a plan of confederation be prepared and transmitted to the respective colonies for their consideration and approbation." John Adams seconded these resolutions, and an animated discussion ensued. On June 8, a committee consisting of Thomas Jefferson, John Adams, Benjamin Franklin, Roger Sherman, and Robert R. Livingston, was appointed to draw up a declaration of independence embodying the sense of Lee's resolutions. On July 2, Lee's resolutions were passed by the vote of twelve of the thirteen colonies, the New York delegates refraining from voting for want of instructions from their province. On July 3, the formal declaration, almost precisely as written by Thomas Jefferson, was presented by the committee above named, and was debated with great spirit, John Adams being the chief speaker on the part of the committee. The discussion was resumed on the morning of the 4th, and at 2 o'clock in the afternoon, after one or two slight modifications, it was adopted. The announcement was hailed with the liveliest enthusiasm. "Ring! ring!" shouted the lad stationed below to give the signal to the old bellman in the State House tower; and he did ring until the whole city shouted for joy. The King's arms were wrenched from the Court House and burned in the streets; bonfires were lighted, the city illuminated, and the exultation was prolonged far into the night. In New York City the populace hurled the leaden statute of George III. from its pedestal and molded it into bullets, and in all the great cities similar demonstrations of enthusiasm were exhibited.

The Declaration of Independence was signed August 2, 1776, when President John Hancock said, "There must be no pulling different ways, we must all hang together," to which Franklin replied, "Yes, we must all hang together, or we shall all hang separately."

State constitutions were adopted in the same year as follows: By New Jersey (July 2), Virginia (July 5), Pennsylvania (July 15), Maryland (Aug. 14), Delaware (Sept. 20), North Carolina (Dec. 18).

1778—Independence of United States acknowledged by France by a treaty of alliance and commerce.

1779—Naval victory of John Paul Jones.

1781—A French fleet in aid of the United States drives the British from Chesapeake Bay. Surrender of Cornwallis.

1782—Independence recognized by Holland.

1783—Independence acknowledged by Sweden, Denmark, Spain and Russia, successively. Definite treaty of peace with Great Britain, Sept. 3.

1789—Formation and adoption of the Constitution.

American politics begins properly with the close of the Revolutionary war, out of which travail this nation was born. When the British departed they left behind them thirteen separate and independent States joined together in a feeble confederation and governed as a whole, so far as they would consent to be governed at all, by the inadequate Continental Congress. The finances were in a deplorable condition; the States were jealous of each other, and of the Congress. As everything was badly defined and unsettled there were constant encroachments and abuses, and it seemed that after achieving freedom America was about to cast it away. During the war there had been two parties, the Tories, who were English in sympathy, and the Whigs, who were American to the core. These gave place to two new divisions, one of which favored a closer and lasting union in which the States should bind themselves together into a compact government—called the Federalists; and one which, while generally admitting the need for a closer and more binding union, still sought to preserve the sovereignty and independence of the States—these were known as the Anti-Federalists. Our Constitution and our form of government are the result of the two opposing forces, and its great flexibility—its perfection—is to be ascribed to the wisdom with which the fathers sought out and chose what was best in the scheme of either.

It is impossible here to do more than outline the growth of parties, but no man can be an intelligent voter who does not study the foundation of the republic. Every citizen should pursue this subject further in the pages of the *Federalist*, which argued one side of the issue, and in the writings of Thomas Jefferson, who upheld the other. It will show how high ran feeling at the time, when it is pointed out that, although the Constitution was adopted in 1787, it was ratified by but eleven States in 1788. Still this was enough to set the new nation up in business.

GEORGE WASHINGTON (1789–1797) was the unanimous choice of the electoral college, and the hero of the revolution became the first President of the United States in 1789. It is not to be imagined that even at that time the people were all of one mind about the Constitution. There is no document—not even the Bible—which is not subject to different interpretations, and the great charter of our American liberties was no exception to the rule. Parties were formed known as strict constructionists and loose constructionists, the former Federalists, the latter Anti-Federalists, the first believing in a strongly centralized government, the second jealously observant of the rights of the States. It will be found that a close analysis of the distinction made there has been and is the dividing line of American parties ever since.

Of course new issues complicated the old ones. The Anti-Federalists changed their name to the Democratic-Republican party, and warmly urged the alliance with France. In the revolution which had just ended, the French alone had first come to our aid, and on land and sea had waged war upon our common enemy. Hence there was a lively sense of gratitude to that great nation throughout the country, made none the less by the establishment of the republic, and hardly destroyed by the atrocities of the Reign of Terror. The Federalists, on the other hand, inclined toward England as the national friend, through the ties of kinship and common language. In spite of these differences of opinion, which were daily growing more bitter, there was practically no partisanship during Washington's administration. He called Federalists and Anti-Federalists into his cabinet, which was composed of men of such opposite views as Alexander Hamilton and Thomas Jefferson, and his farewell address, which every school boy has read, is full of grave warning against the evils and dangers of party spirit.

But with Washington in retirement, the contest began. The Federalists put **JOHN ADAMS** (1797–1801) in the field, and elected him in spite of the English treaty which John Jay had made and which Adams had supported. Thomas Jefferson became vice-president, because at that time the vice-presidency went to the man receiving the next largest vote for president, a system which was in force until 1804.

There were many reasons why the Federalist triumph could not be a permanent one. England was intensely unpopular, and the administration was accused of favoring that kingdom unduly. The alien and sedition laws caused an access of the public displeasure, and the party split into two sections, one following Adams, the other Hamilton. Nominations for the election were made by members of Congress; Adams and Pinkney were chosen

as the Federal standard-bearers, Jefferson and Aaron Burr as the Republican. Jefferson and Burr were elected, but as both had received the same number of votes, the election was thrown into the House, which chose **THOMAS JEFFERSON** (1801–1809) the third president of the United States.

The history of his administration was a quiet one. He refused to make the civil service the spoil of victory, and gave proof of the flexibility of his ideas of government by the purchase of Louisiana Territory from France in 1803, which was a measure tending strongly toward Federalism — giving a hostage, as it were, to the central government on the part of the States. Jefferson also agreed to the building of the great post road to the Ohio, which was by no means a Republican scheme.

JAMES MADISON (1809–1817) was elected fourth president. He, like Jefferson, was a Republican, although, as has been pointed out, that party is more nearly akin to what is to-day called Democracy. C. C. Pinkney, the Federalist candidate who opposed him, and who had run twice against Jefferson, received 47 electoral votes, while Madison was given 122. The Federalists lost every part of the country save New England, and one result of this election was to give that sectional tone to our politics which has to a greater or less extent endured to the present time.

The country was drifting into a war with England at the time, and the public spirit was aroused by the continual outrages perpetrated upon our sailors on the high seas by British ships. The Republicans were recognized as the fighting party, and under the leadership of Calhoun, Clay and Crawford, **the War of 1812** was begun. The Federalists protested, and in Massachusetts and Connecticut the governors refused to allow the militia to go out of the State, save to repel invasion. That argument lasted but a short time, however, for the country was invaded and the city of Washington captured and burned. The treaty of peace was signed in the winter of 1814, but before the news reached this country Andrew Jackson had gained the magnificent victory of New Orleans, on January 8, 1815.

With the close of Madison's administration a new era in our politics began. The questions of Federalism and of the French or English friendship were dead, and new issues were coming up. These were the tariff, the management of finances and the development of industry. What became known as the **Era of Good Feeling** followed, which lasted from the election of **JAMES MONROE** (1817–1825) up to 1828. Upon Monroe's second election in 1821, there was no opposition to him, and he would have had the unanimous vote of the electoral college had not one

of the electors declared that that honor should be confined sacredly to Washington.

It was **the Slavery Question** which put an end to the era of good feeling, and which burned hotly, and more hotly, until it wrapped the whole land in the flames of civil war. It began with the application of Missouri for admission into the Union in 1820. Prior to that time **Mason and Dixon's Line**, which is the boundary of Maryland and Pennsylvania, and the Ohio River, formed the division between slave States and free. Missouri lies beyond the Mississippi River, and out of the limits fixed, and the question was a threatening one until Henry Clay brought in his famous **Missouri Compromise**, which admitted Missouri as a slave State, and forbade slavery north of 36° 30′ north latitude. To balance Missouri in the Senate, Maine was admitted at the same time as a free State.

A protective tariff had been devised by John C. Calhoun in 1816, and President Monroe strengthened and increased the protection accorded. In 1819 he purchased Florida from Spain; and in 1823, in consequence of the war made by Spain against her revolted colonies in the three Americas, he voiced that splendid declaration which will always be associated with his name—**the Monroe Doctrine.** This doctrine briefly is that the United States will not interfere in any European war, nor will it permit European interference or European control in America North or South.

No better proof could be given of the condition of parties than the election which ended Monroe's tenure of office. The electoral college chose a vice-president, John C. Calhoun, but its vote for the presidency was so scattered between Jackson, Adams, Crawford and Clay that the choice was thrown into the House. Here, by an alliance of the friends of Clay and Adams, Jackson was defeated and **JOHN QUINCY ADAMS** (1825–1829) became the sixth president. Clay was rewarded with the portfolio of State, and out of the alliance **the "Whig" Party** was formed. Their principles were in part those of the old Federalists. They were for a high tariff with strong protection, and they early declared for a policy of internal improvements to be paid for by the nation at large. Jackson's followers took the place of the old anti-Federalists; they were strict constructionists, opposed to the tariff, and in their principles and speeches was to be found the nucleus of the States' rights doctrine. They called themselves "**Democrats.**" The four years of Adams' presidency was passed in marshaling and organizing the two opposing forces.

ANDREW JACKSON (1829–1837), the seventh president, carried everything before him. The electoral vote was 178 to 83;

the popular, 647,231 for Jackson, 509,097 for Adams. As soon as he had taken up the reigns of power, Jackson removed some five hundred office-holders from their places, on Marcy's famous theory that "to the victors belong the spoils." Upon this principle the tenure of political office still practically, if not theoretically, depends.

The Tariff was exceedingly unpopular at the South, which was then as now, an agricultural rather than a manufacturing region. Several States had protested, and in 1830 Senator Hayne laid down the doctrine of **Nullification**—that any State could declare null and void any act of Congress. Webster answered this declaration in the debate which has since been famous. The original discussion was not on the tariff regulations, but on the sale of public lands. The struggle was a hot one. Jackson took occasion to put himself on record at once with his celebrated toast, "Our Federal Union, it *must* be preserved." The words were first uttered at a dinner in honor of his birthday. Calhoun took the opposite view, and in 1831 the president's cabinet was broken up by the issue. A new tariff bill was passed, but the South was still dissatisfied, and in 1832 South Carolina passed the Nullification ordinance. Jackson at once sent a naval force into Charleston harbor, and Congress passed a bill enforcing the tariff; but Henry Clay again came forward with a compromise which was accepted on both sides.

The United States Bank was the next bone of contention. It had been chartered in 1816 for twenty years. After a struggle with Congress, and with his secretary of the Treasury, Duane, who would not remove the national deposits from the bank, Jackson dismissed Duane and appointed Taney secretary of the Treasury. The deposits ceased. The Senate at once passed a vote of censure on the president, but the House, after investigating the bank, sustained Jackson at every point and refused a new charter. The fight with the Senate, in which there was an adverse majority, continued until the end of Jackson's term. During his administration was the first weak beginning of the **Abolition** party. The Anti-Slavery Society was formed in 1833. It was the target for abuse and violence, which culminated in the assassination of Lovejoy. Congress solemnly declared that it would listen to no petitions upon the question of slavery, and Jackson asked that the sending of abolition documents through the mails should be prohibited. This the Senate refused.

The Democratic candidate, **MARTIN VAN BUREN** (1837–1841), the eighth president, was elected over W. H. Harrison and several other opposition nominees, including Daniel Webster. He followed out Jackson's policy to the letter, one part of which, the celebrated "specie circular," brought on **the Great Panic of 1837.**

This was an order to United States agents to receive only gold and silver for public lands. Banks collapsed, money became scarce, and failures were most frightfully numerous. In 1840 Van Buren was renominated, but the Whigs, by an attack on the Democratic financial policy, carried the country and elected **W. H. HARRISON** (1841) the ninth president. It was in this campaign that the abolitionists produced their first national platform, which favored the abolition of slavery in the District of Columbia and the Territories. In the same year the Democracy at Baltimore resolved that Congress had no power to interfere with or control the domestic institutions of the several States, which were the sole and proper judges of everything pertaining to their own affairs not prohibited by the Constitution, and that the efforts "by Abolitionists or others" to interfere with questions of slavery were calculated "to lead to the most alarming and dangerous consequences," "to diminish the happiness of the people and endanger the stability and permanence of the Union, and ought not to be countenanced by any friend of our political institutions." The convention also adopted a resolution to the effect that every attempt to abridge the rights or privileges of foreign-born citizens should be resisted. This was aimed at the Know-nothing tendency then just appearing, which had, however, no affiliation with the Abolition movement, already vigorous.

Harrison did not live out the year, and he was succeeded by the vice-president, **JOHN TYLER** (1841–1845), the tenth president. Tyler rapidly got into trouble with his cabinet, which, save Webster, deserted him on issues connected with his attempt to carry out Harrison's financial policy. The slavery question was pressing forward more and more urgently for solution all this time. An Ohio Congressman, Giddings, brought the issue into the House of Representatives, and was censured by that body for so doing. He resigned and was at once unanimously re-elected. A new tariff bill was brought in, and the proposition then made for a division of the surplus among the States.

Finance, protection, internal improvements, and indeed every minor issue, had to give way to the great puzzle of slavery. It was coming on for adjustment, and no hand could stay it. In the campaign of 1844 it produced the dispute over the re-annexation of Texas. The Democratic platform declared the **Great American Measures**—the taking in of Texas and Oregon. As Texas would be a slave territory, the idea was antagonized in the North, but after a close and perplexed election **JAMES K. POLK** (1845–1849), the eleventh president, was elected. Henry Clay, the Whig candidate, was beaten by the vote of 62,300 which was given to Jas. G. Birney by the Liberty party.

The new administration at once took up the Texas matter, and the **War with Mexico** was the necessary consequence. The history of that struggle will be found in its appropriate place in this book. It is here necessary merely to point out the results. By the treaty of Guadalupe-Hidalgo, the United States acquired all that country which we now call the great West, including the treasures of California and the Sierras. The northwestern frontier was fixed at the 49th degree of north latitude, and the administration closed with the largest accession of land that had yet been made to the Republic.

The Wilmot Proviso attempted to block slavery in the new territories, and Oregon was organized as free soil. A low tariff bill was passed, and the Whigs got through a river and harbor bill which the president promptly vetoed. This brought the country up to the campaign of 1848, in which the Whigs recovered the government. The platform of the Democracy made at Baltimore approved the Mexican war, congratulated the republic of France on achieving its liberty, and the world on the downfall of thrones and dominations everywhere. The same year, at Philadelphia, the Whigs resolved merely that Zachary Taylor was the best man for president. At Buffalo, in the same year, the Abolitionists determined that they would forget all past political differences in a common resolve to maintain the rights of free labor against the aggression of the slave power, and to secure a free soil to a free people. This convention also demanded cheap postage; river and harbor improvements when required for the general convenience; indorsed the idea of the homestead law; and inscribed on its banner "free soil, free speech, free labor and free men."

The magic of military success and the excellent organization of the Whigs made **ZACHARY TAYLOR** (1849–1850) twelfth president. He lived but a short time and was succeeded by the vice-president, **MILLARD FILLMORE** (1850–1853), thirteenth president.

With 1850 what might be called the war period of American politics began. In this year was introduced the Clay compromise, which admitted California as a free State, but on the other hand altered the **Fugitive Slave Laws**, which inflamed the North to the point of war. Several of the States met the action of Congress by personal liberty laws, which really amounted to nullification. The old parties broke up; there were Democrats, and Free Soil Democrats, and Whigs. Winfield Scott, the Whig candidate, carried only four States in the Union, and **FRANKLIN PIERCE** (1853–1857), the fourteenth president, was elected.

There was soon actual fighting, on the dividing line between North and South. The **Kansas–Nebraska Bill** repealed the Mis-

souri compromise and made all new territory open to slavery. The Whig party split in two on this issue, one of the sections becoming the Republican party of the day, the other going over finally to the Democrats, a fact which will account for much of the confusion on purely financial and tariff issues to be found in both those parties to-day. When you find a Republican who is a free trader, or a Democrat who is a protectionist, the anomaly is to be traced directly to the fissure, and the new sides taken in the 1850's on the free soil question.

Passions were at fever heat. In Kansas the "Jayhawkers" and the "Border Ruffians" were already at each other's throats. It was plain that the matter in dispute could only be settled by an appeal to the arbitrament of arms.

In 1856 the Republicans nominated their first candidate, Gen. John C. Fremont, "the Pathfinder." Their platform recites that the convention was called without regard to previous political differences, to enable all opposed to the repeal of the Missouri compromise to come together. The platform opposed the extension of slavery into the territories; declared that Congress should prohibit in the territories "the twin relics of barbarism, polygamy and slavery;" and opposed all prescriptive legislation, thus antagonizing the Democracy on the slavery issue and the Know-nothings on nativism. The Whigs met at Baltimore. Their platform is devoted exclusively to a denunciation of "geographical parties," and a recommendation of Millard Fillmore, the American or "Know-nothing" candidate for President. The Democrats added little to former platforms, save that they declared against the Know-nothings on their war on foreigners, and agreed with them in their declaration against intervention with slavery. They nominated and elected **JAMES BUCHANAN** (1857-1861), fifteenth president. Fremont, however, polled a popular vote of 1,341,264 against Buchanan's 1,838,169, while Fillmore received 874,534.

The **Dred Scott Case** now came on to exacerbate still more bitterly public feeling. Chief Justice Taney declared that a negro was a chattel, that the compromise of 1820 was unconstitutional, and that a slave-owner might settle with his property where he pleased, in any territory. Following this came John Brown's raid into Virginia—his attempt to excite a slave insurrection, and his death upon the gallows. There was nothing for it but war, and into war the country rapidly drifted.

The campaign of 1860 was the most confused in the whole history of American politics. There was talk of secession in the air. There was notoriously war preparation in the South. The North was divided. Every man felt that parties would have to be re-arranged and new political frontiers defined. The

"Constitutional Union" party met at Baltimore. All it demanded was the "Constitution of the country, the union of the States, and the enforcement of the laws." The Republicans met at Chicago. The platform is the most significant in the political history of the republic, and contains the essence of all its history since that date. It denounced the threats of disunion made by Democrats in Congress as an "avowal of contemplated treason" which it was the duty of the people to "rebuke and forever silence." It asserted that the normal condition of all the territory of the United States is that of freedom; that the reopening of the slave trade was a crime against humanity; that duties should be adjusted so as to encourage the development of the industrial interests of the whole country; that Congress should pass a complete and satisfactory homestead law; that the rights of citizenship enjoyed by foreigners should not be abridged or impaired; that the rights of all citizens, native or naturalized, should be protected abroad and at home. The Douglas Democratic platform, adopted at Charleston, favored the acquisition of Cuba; declared that State legislatures which interfered with the enforcement of the fugitive slave law were revolutionary and subversive of the Constitution; and reaffirmed the Cincinnati platform of 1856 on tariff. The Breckinridge platform, adopted at Charleston and Baltimore, reaffirmed the Democratic platform adopted at Cincinnati, with certain "explanatory resolutions," which in substance were that slave-owners had a right "to settle with their property" in the territories without being interfered with by territorial or congressional legislation.

On these issues four candidates were put in the field. The Republicans nominated Abraham Lincoln; the Democrats, J. C. Breckinridge; the Constitutional Union party, John Bell; the Independent Democrats, Stephen A. Douglas. **ABRAHAM LINCOLN** (1861-1865) was chosen sixteenth president, by a popular vote of 1,866,352; Douglas received 1,375,157; Breckinridge, 845,763; Bell, 589,581.

On December 20, 1860, South Carolina declared that the Union was dissolved, and a **Secession** resolution was passed. Following, six other slave States immediately seceded. Every effort was made to stem the tide of disunion, but nothing could be done save with arms in the field. A peace congress met and proved futile. The Crittenden compromise was scoffed out of court. The Confederate States of America was formed at Montgomery, Alabama, in February, 1861, with Jefferson Davis as president, and slavery and low tariffs as its corner stone. The first ball was fired April 14, 1861, and the great issue of the century joined.

For the time politics were relegated to the background.

There were only Unionists and Secessionists. The financing of the great struggle led to a high tariff, the issue of treasury notes, and finally the establishment of the national banking system. The internal revenue system was developed, an income tax was imposed, greenbacks were issued, and the resources of the country marshaled to meet the expenses of a war that cost $1,000,000 a day.

On Jan. 1, 1863, President Lincoln issued the **Emancipation Proclamation**, which freed the Southern slaves, and marks an epoch in the history of the world. Two years later, under the apple tree at Appomattox, Lee surrendered to Grant, and the war ended with the complete triumph of the Northern arms. There had in the meantime been another presidential election, in which Lincoln defeated George B. McClellan and John C. Fremont. Shortly after Lee's surrender Lincoln was assassinated by J. Wilkes Booth, an actor, and **ANDREW JOHNSON** (1865-1869), the seventeenth president, took up the chief magistracy.

The problem of the day was the **Reconstruction** of the old slave States, upon which the new president and his party at once quarreled. The point at issue was the proper safe-guarding of the newly-freed negro. Congress passed the Civil Rights bill, the Freedman's Bureau bill, and submitted the XIVth Amendment to the Constitution. The president was finally impeached by Congress, but his trial before the Senate resulted in an acquittal by one vote.

ULYSSES S. GRANT (1869-1877), the eighteenth president, was elected over Horatio Seymour, on a platform adopted by the Republicans at Chicago, which denounced repudiation; favored suffrage on equal terms to all men; encouraged immigration and declared itself in sympathy with all oppressed people who are struggling for their rights. The Democratic platform of 1868 acknowledged that the questions of slavery and secession had been forever settled by the war or by constitutional conventions; and favored amnesty for all political offenses. It made a very distinct pronouncement on tariff in the following words: "A tariff for revenue upon foreign imports, and such equal taxation under the internal revenue laws as will afford incidental protection to domestic manufactures, and as will, without impairing the revenue, impose the least burden upon, and best promote and encourage, the great industrial interests of the country."

The XVth Amendment, guaranteeing negro suffrage, was passed by Congress in 1869. A Liberal Republican ticket, with Horace Greeley at its head, was supported by the united opposition against Grant in 1872, but was defeated easily, and Greeley, one of the greatest figures in later American politics, died shortly

afterwards. The South was pacified, and the **Treaty of Washington** made, which involved the payment of the Alabama claims by the English Government.

In 1876 occurred the famous **Hayes and Tilden Controversy**, which tested the flexibility of our electoral machinery so severely. Tilden was the Democratic nominee, and he had an undoubted popular majority—4,284,265, against 4,033,295 for Hayes. Rival electors claimed to have been elected in Louisiana and Florida. Intimidation, fraud and illegal voting were charged, and Congress finally appointed the **Electoral Commission** to settle the dispute, as there was nothing in the Constitution to cover the circumstances. On a party vote the commission awarded the disputed electoral votes to the Republican candidate, thus making **RUTHERFORD B. HAYES** (1877–1881) nineteenth president of the United States. Specie payment was resumed during this administration, and the silver coinage act passed.

From this time on to the present the tariff issue has been the chief matter of debate in each campaign. In 1880 the Republicans elected **JAMES A. GARFIELD** (1881) twentieth president. He was assassinated by a madman, Charles J. Guiteau, and **CHESTER A. ARTHUR** (1881–1885) became twenty-first president. The most important measure of this administration was the passage of the Pendleton civil service reform bill.

GROVER CLEVELAND (1885–1889), the twenty-second president, was the first Democrat chosen since the war. Out of his famous tariff reform message the Democratic platform of 1888 was stated at St. Louis, and the country was invited to choose squarely between protection as represented by Benjamin Harrison, the Republican candidate, and a tariff revision as represented by Cleveland.

The result was, after one of the most remarkable struggles in American politics, already known by its well earned name of the **Campaign of Intellect**, that **BENJAMIN HARRISON** (1889— . . .) was elected twenty-third president of the United States.

THE BY-WAYS OF AMERICAN POLITICS.—The minor American parties which have appeared and disappeared during our century and over of national life are the following: **Anti-Renters**, a New York party which flourished about 1841. They resisted the collection of back rents on the Van Rensselaer manor near Albany. They had strength enough to defeat Wright, the regular Democratic candidate for Governor of New York. **Barn-burners**, New York, 1846, seceders from the Democratic party. They were opposed to slavery extension. **Bucktails**, New York, about 1815; they supported Madison. **Conservatives**, New York and some other States, 1837; paper money Democrats. **Doughfaces**, 1820, Northern members of Congress who voted in favor of the Missouri compromise. **Hunkers**, New York, a faction of the Democrats favoring the South, Barnburners being the other factor. **Know-Nothings**, New York, 1854, opposed to naturalization of foreigners unless they had been twenty-one years in the country.

Loco-Focos, New York, 1835; a branch of the Democratic party. **Liberal Republicans,** 1872; Republicans who joined with the Democrats in support of Greeley for president. **Temperance,** or Prohibition, from 1830 down, in many States; in favor of preventing or restricting the sale of liquors. The total Prohibition vote at the Presidential election in 1888 was 249,937. **Woman's Rights,** from 1860 down; those who favored granting to women the right of suffrage.

PRESIDENTS OF THE UNITED STATES.

Name.	Native State	Ancestry.	Residence.	Inaugurated. Year.	Inaugurated. Age.	Politics.	Place of Death.
George Washington.	Va....	English...	Va....	1789	57	Fed..	Mount Vernon,1799
John Adams.....	Mass.	English...	Mass.	1797	62	Fed..	Quincy, Mass.,1826
Thomas Jefferson ...	Va....	Welsh....	Va....	1801	58	Rep..	Monticello, Va. 1826
James Madison.....	Va....	English...	Va....	1809	58	Rep..	Montpelier.Va.1836
James Monroe.....	Va....	Scotch....	Va....	1817	59	Rep..	NewYork City,1731
John Quincy Adams.	Mass.	English...	Mass.	1825	58	Rep..	Washington, 1848
Andrew Jackson....	S. C..	Scot-Irish.	Tenn	1829	62	Dem..	Hermitage,Ten.,'45
Martin Van Buren..	N. Y..	Dutch....	N. Y..	1837	55	Dem..	Kinderhook NY,'62
William H. Harrison	Va....	English...	Ohio..	1841	58	Whig.	Washington, 1841
John Tyler.....	Va....	English...	Va....	1841	51	Dem..	Richmond,Va, 1862
James K. Polk.....	N. C..	Scot-Irish.	Tenn.	1845	60	Dem..	Nashville,Ten, 1849
Zachary Taylor.....	Va....	English...	La...	1849	55	Whig.	Washington, 1850
Millard Fillmore....	N. Y..	English...	N. Y..	1850	50	Whig.	Buffalo, N. Y., 187
Franklin Pierce.. ..	N. H.	English...	N. H.	1853	49	Dem..	Concord, N.H,1869
James Buchanan....	Pa. ..	Scot-Irish.	Pa...	1857	60	Dem..	Wheatland,Pa,1868
Abraham Lincoln...	Ky...	English...	Ill....	1861	52	Rep..	Washington, 1865
Andrew Johnson....	N. C.	English...	Tenn.	1865	57	Rep..	Greenville, Ten, '75
Ulysses S. Grant....	Ohio..	Scotch....	Ill....	1869	47	Rep..	MtM'Gregor NY'85
Rutherford B. Hayes	Ohio..	English. .	Ohio..	1877	55	Rep.	.....
James A. Garfield...	Ohio..	English...	Ohio..	1881	49	Rep..	Long Branch, 1881
Chester A. Arthur...	Vt....	Scot-Irish	N. Y..	1881	51	Rep..	New York City,1886
Grover Cleveland...	N. J..	English...	N. Y..	1885	48	Dem..	.....
Benjamin Harrison..	Ohio..	English...	Ind...	1889	56	Rep..	.....

GENERALS COMMANDING THE U. S. ARMY.

	From	To		From	To
George Washington.	1775	1783	Alexander Macomb.	1828	1841
Henry Knox.....	1783	1784	Winfield Scott.....	1841	1861
Josiah Harmer.... .	1788	1791	George B. McClellan	1861	1862
Arthur St. Clair....	1791	1796	Henry W. Halleck..	1862	1864
James Wilkinson....	1796	1798	Ulysses S. Grant....	1864	1869
George Washington.	1799	1799	William T. Sherman	1869	1883
James Wilkinson....	1800	1812	Philip H. Sheridan..	1883	1888
Henry Dearborn....	1812	1815	John M. Schofield...	1888	....
Jacob Brown	1815	1828			

If a railway were built to the sun, and trains upon it were run at the rate of 30 miles an hour, day and night, without a stop, it would require 350 years to make the journey from the earth to the sun.

Statement of the Number of United States Troops Engaged.

Wars.	From—	To—	Regulars.	Militia and Volunteers.	Total.
War of the Revolution...	Apr 19, 1775	Apr 11, 1783	130,711	164,080	309,781
Northwestern Indian wars	Sept 19, 1790	Aug 3, 1795	.....	.....	8,983
War with France.....	July 9, 1798	Sept 30, 1800	.....	.....	*4,593
War with Tripoli.....	June 10, 1801	June 4, 1805	.....	.....	*3,330
Creek Indian war.....	July 27, 1813	Aug 9, 1814	600	13,181	13,781
War 1812 with Gt. Britain	June 18, 1812	Feb 17, 1815	85,000	471,622	576,622
Seminole Indian war.....	Nov 20, 1817	Oct 21, 1818	1,000	6,911	7,911
Black Hawk Indian war.	Apr 21, 1831	Sept 31, 1832	1,339	5,126	6,465
Cherokee disturbance or removal	1836	1837	.....	9,494	9,494
Creek Indian war or disturbance.....	May 5, 1836	Sept 30, 1837	935	12,483	13,418
Florida Indian war.....	Dec 23, 1835	Aug 14, 1843	11,169	29,953	41,122
Aroostook disturbance...	1838	1839	.....	1,500	1,500
War with Mexico.....	Apr 24, 1846	July 4, 1848	30,954	73,776	112,230
Apache, Navajo, and Utah war.....	1849	1855	1,500	1,061	2,561
Seminole Indian war.....	1856	1858	.....	3,687	2,687
Civil war†	1861	1865	.....	.....	2,772,408

* Naval forces engaged. † The number of troops on the Confederate side was about 600,000.

The number of casualties in the volunteer and regular armies of the United States, during the war of 1861-65, was reported by the Provost Marshal General in 1866: Killed in battle, 61,362; died of wounds, 34,727; died of disease, 183,287; total died, 279,376; total deserted, 199,105. Number of soldiers in the Confederate service who died of wounds or disease (partial statement), 133,821. Deserted (partial statement), 104,428. Number of United States troops captured during the war, 212,608; Confederate troops captured, 476,169. Number of United States troops paroled on the field, 16,431; Confederate troops paroled on the field, 248,599. Number of United States troops who died while prisoners, 29,725; Confederate troops who died while prisoners, 26,774.

The Bible.

There is no date from beginning to end in the Bible. It comprises some 60 documents, and is supposed to have been written by about 40 men; 54 miracles are recorded in the Old and 51 in the New Testament; total, 105. The shortest verse in the Old Testament is "Remember Lot's wife." There is one in the New Testament as short as John xi. 35, in point of words, but not in letters, viz: Thessalonians v. 16, "Rejoice evermore." Then there are 2 chapters in the Bible alike verbatim, and 1 book, Esther, in which the Deity is not mentioned.

Number of Men in the Union Army Furnished by Each State and Territory, from April 15, 1861, to Close of War.

States and Territories.	Number of Men Furnish'd	Aggregate Reduced to a Three Years' Standing.	States and Territories.	Number of Men Furnish'd	Ag'regate Reduced to a Three Years' Standing.
Alabama	2,556	1,611	New York	448,850	392,270
Arkansas	8,289	7,836	North Carolina	3,156	3,156
California	15,725	15,725	Ohio	313,180	240,514
Colorado	4,903	3,697	Oregon	1,810	1,773
Connecticut	55,864	50,623	Pennsylvania	337,936	265,517
Delaware	12,284	10,322	Rhode Island	23,236	17,866
Florida	1,290	1,290	South Carolina	.....	.....
Georgia	.....	.....	Tennessee	31,092	26,394
Illinois	259,092	214,133	Texas	1,965	1,632
Indiana	196,363	153,576	Vermont	33,288	29,068
Iowa	76,242	68,630	Virginia	.....	.....
Kansas	20,149	18,706	West Virginia	32,068	27,714
Kentucky	75,760	70,832	Wisconsin	91,327	79,260
Louisiana	5,224	4,654	Dakota	206	206
Maine	70,107	56,776	Dist of Columbia	16,534	11,506
Maryland	46,638	41,275	Indian Territory	3,530	3,530
Massachusetts	146,730	124,104	Montana	.....	.....
Michigan	87,364	80,111	New Mexico	6,561	4,432
Minnesota	24,020	19,693	Utah	.....	.....
Mississippi	545	545	Washington Ter.	964	964
Missouri	109,111	86,530	U S Army	.....	.....
Nebraska	3,157	2,175	U S Volunteers	.....	.....
Nevada	1,080	1,080	U S col'r'd troops	93,441	91,789
New Hampshire	33,937	30,849			
New Jersey	76,814	57,908	Total	2,772,408	2,320,272

The armies of the United States were commanded during the war of the Rebellion by President Lincoln as commander-in-chief under the constitutional provision; and under him, as general commanders, by Brevet Lieutenant General Winfield Scott until Nov. 6, 1861; by Major General George B. McClellan from Nov. 6, 1861, to March 11, 1862; by Major General Henry W. Halleck from July 11, 1862, to March 12, 1864 (there being no general commander between March 11 and July 11, 1862); and Lieutenant General and General U. S. Grant from March 12, 1864, to March 4, 1869. The first of the principal armies into which the force of the United States was divided was the Army of the Potomac. This army was called into existence in July, 1861, and was organized by Major General George B. McClellan, its first commander; Nov. 5, 1862, Major General A. E. Burnside took command of it; Jan. 25, 1863, Major General Joe Hooker was placed in command, and June 27, 1863, Major General George G. Meade succeeded him. The Army of the Ohio was organized by General D. C. Buell, under a general order from the

War Department dated Nov. 9, 1861, from troops in the military department of the Ohio. General Buell remained in command until Oct. 30, 1862, when he was succeeded by General W. S. Rosecrans. At this time the Army of the Ohio became the Army of the Cumberland and a new department of the Ohio was formed and Major General H. G. Wright assigned to the command thereof. He was succeed by Major General Burnside, who was relieved by Major General J. G. Foster of the command of both department and army. Major General Schofield took command Jan. 28, 1864, and Jan. 17, 1865, the department was merged into the Department of the Cumberland. The Army of the Cumberland was formed of the Army of the Ohio, as above noted. It continued under the command of General Rosecrans until October, 1863, when General George H. Thomas took command of it. The Army of theTennessee was originally the Army of the District of Western Tennessee, fighting as such at Shiloh. It became the Army of theTennessee on the concentration of troops at Pittsburgh Landing under General Halleck, and when the Department of the Tennessee was formed,Oct. 16, 1862, the troops serving therein were placed under command of Major General U. S. Grant. Oct. 27, 1863, Major General William T. Sherman was appointed to the command of this army; March 12, 1864, Major General J. B. McPherson succeeded him; July 30, 1864, McPherson having been killed, Major General O. O. Howard was placed in command, and May 19, 1862, Major General John A. Logan succeeded him. Other minor armies were the Army of Virginia, which was formed by the consolidation of the forces under Major Generals Fremont, Banks and McDowell, by order of the War Department, Aug. 12, 1862. Major General John Pope was placed in command, but after the disastrous defeat of this general at Manassas the army as such was discontinued and its troops transferred to other organizations. The Army of the James was formed of the Tenth and Fourteenth corps and cavalry, and was placed under the command of Major General Butler. Its operations were carried on in conjunction with the Army of the Potomac. Other temporary arrangements of the troops formed the Army of the Mississippi in the Mississippi River operations in 1862; the Army of the Gulf in Louisiana in May, 1863; the Army of West Virginia, in the valley of the Shenandoah, in May, 1864, and the army of the Middle Military Division in Virginia in the fall of 1864.

A HORSE will live 25 days without solid food, merely drinking water; 17 days without either eating or drinking; and only 5 days when eating solid food without drinking.

DATE.	PLACE.	FEDERAL LOSS.	CONFED. LOSS.
Apr. 12, 1861	Bombard'nt Ft. Sumter	.....no one hurt	.....5 w
" 19	Riot Baltimore	.....3 k, 7 w	.....7 k, 8 w
June 20	Big Bethel, Va	.....16 k, 34 w, 6 m	.....no report
July 5	Carthage, Mo	.....13 k, 31 w	.....250 k & w
" 12	Rich Mountain, W. Va	.....11 k, 35 w	.....140 k, 150 w
" 21	Bull Run, Va	...4500 k; w, p, 28 c ..481 k, 1011 w, 700 p	.....1852 k & w
Aug. 10	Wilson's Creek, Mo	.223 k, 721 w, 292 m	...421 k, 1317 w, 3 m
Sept. 12-14	Cheat Mountain, W. Va.	.....13 k, 20 w, 60 p	.....100 k & w, 20 p
" 20	Lexington, Mo	..42 k, 108 w, 1624 p	.....25 k, 75 w
" 21	Ball's Bluff, Va	..220 k, 266 w, 500 p	.....36 k, 264 w, 2 p
Nov. 7	Belmont, Mo	...84 k, 288 w, 285 m	..261 k, 427 w, 278 m
" 7	Port Royal, S. C	.....8 k, 23 w, 256 p	..k and w no report ....2500 p, 42 guns c
" 8	Piketon, Ky	.....6 k, 24 w	.400 k and w, 2000 p
Dec. 18	Milford, Mo	.....2 k, 17 w	.....1300 p
Jan. 19, 1862	Mill Spring, Ky	.....39 k, 207 w	.....192 k, 140 p
Feb. 8	Roanoke Island, N. C	.....50 k, 150 w	....30 k, 50 w, 2500 p
" 8	Fort Henry, Tenn		
" 16	Fort Donelson, Tenn	.446 k, 1735 w, 150 p	231 k, 1007 w, 15000 p
Mar. 8	Pea Ridge, Ark	....1351 k, w and m	1100 k, 2500 w, 1600 p
" 14	Newbern, N. C	.....91 k, 466 w	...50 k, 200 w, 200 p
" 23	Winchester, Va	.....100 k, 400 w	....600 k & w, 300 p
Apr. 6-7	Pittsburg Landing, Tenn.	1614 k, 7721 w, 3963 m	1728 k, 8012 w, 959 m
" 10	Island No. 10		.....17 k, 6300 p
May 5	Williamsburg, Va	...2073 k & w, 623 p	.700 k, 1000 w, 300 p
" 25	Winchester, Va		
" 29	Hanover C. H., Va	.....53 k, 526 m	.....500 k & w, 600 p
" 30	Corinth, Minn		
" 31	Fair Oaks, Va	890 k, 3627 w, 1222 p	.....2800 k, 3897 w
June 1	Fair Oaks, Va	.....5739 k & w	..... 8000 k & w
" 8	Cross Keys, Va	.....125 k, 500 w	..... 600 k & w
" 9	Port Republic, Va	...67 k, 361 w, 574 m	.....1000 k, w & m
" 26	Chickahominy, Va	.....80 k, 150 w	.....1000 k & w
" 27	Gaines Mills, Va	.....7500 k, w and m	.....About the same
July 1	Malvern Hill, Va	.....1000 k, w and m	.....Nearly 5000
Aug. 5	Baton Rouge, La	.....250 k, w and m	.....600 k, w & m
" 9	Cedar Mountain, Va	.....1500 k, w and m	.....1000 k, 1500 w
" 22	Gallatin, Tenn	... 64 k, 100 w, 200 p	.....110 k & w
" 27	Kettle Run, Va	.....800 k, w and m	...800 k & w, 1000 p
" 29	Groveton, Va	.....6000 k, and w	.....12000 k, w & m
" 30	Bull Run 2nd	.800 k, 4000 w, 3000 p	.....700 k, 3000 w
" 29-30	Richmond, Ky	..200 k, 700 w, 2000 p	.....250 k, 500 w
Sept. 1	Chantilly, Va	.....1300 k and w	.....800 k & w
" 14	South mountain, Md	.443 k, 1806 w, 76 m	500 k, 2343 w, 1500 p
" 15	Harper's F'y, 3 d'ys' siege	.80 k, 120 w, 11583 p	.....1500 k & w
" 17	Antietam, Md	.....12500 loss	.....15000 loss
" 19-20	Iuka, Miss	.....135 k, 527 w	..263 k, 400 w, 600 p
Oct. 3-5	Corinth, Miss	315 k, 1812 w, 232 m	1423 k, 2268 p, 5692 w
" 8	Perryville, Ky	.....3200 k, w and m	1300 k, 3000 w, 200 p
Dec. 7	Prairie Grove, Ark	.....495 k, 600 w	.....1500 k & w
" 13	Fredericksburg, Va	1512 k, 6000 w, 2078 p	.....1800 k & w
" 27-29	Vicksburg	..191 k, 982 w, 756 m	..... no report
Jan. 2, 1863	Stone River, Tenn	.....1533 k, 6000 w	..9000 k & w, 1000 p
" 11	Fort Hindman, Ark	.....1000 k, w & m	...550 k & w, 5000 p
Feb. 3	Fort Donelson, Tenn	.....12 k, 20 w	..100 k, 400 w, 300 p
May 1	Suffolk, Va	....130 k, 718 w, 5 m	.....1500 k, w & m

DATE.	PLACE.	FEDERAL LOSS.	CONFED. LOSS.
May 1	LaGrange, Ark.	.....2000 k, w & m	.....
" 2	Fredericksburg, Va.	.....2000 k & w	.....
" 2-3	Chancellorsville, Va.	15000 k & w, 17000 p	18000 k & w, 5000 p
" 12	Jackson, Miss.	.....40 k, 240 w, 6 m	.....400 k & w
" 14	Champion Hills, Miss.	.....426 k, 1842 w	.....400 k, w & m
" 16	Big Black River, Miss.	.....29 k, 242 w	.....2600 k, w & m
" 18-22	Vicksburg, Miss.	.....2500 loss	.....no report
" 27	Port Hudson	.....900 k, w & m	.....600 k, w & m
June 6	Milliken's Bend, Miss.	..127 k, 287 w, 157 m	.....200 k, 500 w
" 9	Beverly Ford, Va	.....380 k, w & m	.....750 k, w & m
" 14	Winchester, Va.	.....2000 k. w & m	.....850 k, w & m
" 26	Shelbyville, Tenn.	....85 k, 468 w, 13 m	1634 p, no rep't k & w
July 1-2-3	Gettysburg, Pa.	.....total loss 28198	.....total loss 37000
" 4	Vicksburg surrenders	.245 k, 3688 w, 303 p	9000 k & w, 30000 p
" 4	Helena, Ark.	.....250 k, w & m	...500 k & w, 1000 p
" 5	Bolton, Miss.	.....	.....4000 p
" 8	Port Hudson surrenders.	.....	.....5500 p
" 18-19	Ft. Wagner, S. C.	..... 700 k, w & m	.....500 k, 331 w
Sept. 9	Cumberland Gap.	.....	.....2000 p
" 19-20	Chickamauga.	1644 k, 9262 w, 4945 m	....17000 k, w & m
" 14	Bristow Station, Va.	.....51 k, 329 w	...1200 k & w, 800 p
Dec. 4	Knoxville, Tenn.	..... 600 k & w	.....1600 p
" 23-25	Chattanooga.	.....4000 k & w	.....16000 k, w & m
" 25	Missionary Ridge.	.....	.....
" 27	Ringgold, Ga.	.....800 k, w & m	.....300 p
" 27-30	Locust Grove, Va.	.....1000 k, w & m	.....2500 k, w & p
Mar. 25, 1864	Paducah, Ky.	.....14 k, 46 w	.....1000 k & w
Apr. 8-9	Mansfield, La	...500 k & w, 1500 p	.....2000 p
" 17-20	Plymouth, N. C.	.....150 k, 1700 p	.....1500 k & w
May 5-7	Wilderness, Va.	.....loss 30000	.....loss 30000
" "	Spottslyvania, Va	.....loss 10000	.....loss 10000
" 12	Spottsylvania, Va	.....	.....4000 p
" 12-15	Ft. Darling, Va.	.....5000 k, w & m	.....no report
" 13-15	Resaca, Ga.	.....700 k, 2800 w	.....no report
" 25-28	Dallas, Ga	.....1800 k & w	...300 p, 4000 k & w
June 1	Cold Harbor, Va	.....9000 k, w & m	.....8000 k, w & m
" 15-18	Petersburgh, Va	.....loss 10000	.....no report
" 22	Weldon R. R., Va.	...600 k & w, 1250 p	.....no report
" 27	Kennesaw Mt., Ga.	.....1000 k & w	.....no report
July 9	Monocracy, Md.	.....1000 k & w	.....no report
" 20	Peach Tree Creek, Ga.	.....1713 k, w & m	..5000 k & w, 1000 p
" 22	Atlanta, Ga.	.....3521 k & w	.....10000 k & w
" 27-30	Petersburgh, Va.	.....5000 k, w & m	.....1200 k, w & m
Aug. 5-20	Mobile Bay, Ala.	.....120 k, 88 w	no rep't k & w, 1756 p
" 15-18	Deep Bottom, Va.	.....loss 4000	.....loss 2500
" 19	6 Mile Station, Va	.....3000 k & w	.....1500 p
" 25	Weldon R. R., Va.	...1000 k & w, 3000 p	.....1500 k & w
" 31	Atlanta, Ga	....50 k, 50 m, 439 w	.....5000 k & w
Sept. 19	Winchester, Va.	.....3000 k & w	500 k, 4000 w, 2500 p
" 21	Fisher's Hill.	.....600 k & w	....400 k & w, 1100 p
" 26	Ironton, Mo.	.....9 k, 60 w	.....1500 k & w
29—Oct. 1	Petersburg, Va	.....5000 k & w	.....2800 k & w
Oct. 19	Cedar Creek, Va	..4000 k & w, 1300 p	..2800 k & w, 1300 p
" 26	Nims' Creek, Mo	..2000 p, 1000 k & w	.....900 k, 3800 p
" 27	Hatcher's Run, Va	800 m, 400 k, 1500 w	.....1600 k, w & m
Nov. 30	Franklin, Tenn.	189 k, 1033 w, 1104 m	1750 k, 3800 w, 702 p
Dec. 15	Nashville, Tenn	.....6500 k, w & m	.....23000 k, w & m

DATE.	PLACE.	FEDERAL LOSS.	CONFED. LOSS.
Jan. 15, 1865	Ft. Fisher	110 k, 536 w	440 k & w, 2500 p
" 20-22	Wilmington, N. C.	250 k & w	1072 p
Feb. 27	Waynesboro', Va	69 k & w	5 k, 1352 p
" "	Kingston, N. C.	loss 1000	1200 k & w, 2400 p
" "	Averasboro', N. C.	74 k, 774 w	327 k, 373 p
Mar. 19	Bentonville, N. C.	loss 1646	167 k, 1625 p
" 25-27	Petersburgh, Va	180 k, 1240 w, 990 m	2200 k & w, 2800 p
Apr. 1	Five Forks, Va	loss 3000	5000 p
" 2	Selma, Ala		3000 p
" 2-3	Petersburgh & Richmond	8000 k, w & m	9000 k, w & m
" 6	Farmville & Sailors Ck.		6000 p
" 9	Surrender of Gen. Lee		26115 p
" 11	Ft. Blakely, Mobile	2000 k & w	500 k & w, 4300 p
" 12	Surrender of Mong'y, Ala.		2700 p, 100 g
" 12	Salisbury, N. C.		1800 p
" 26	Surrender of Gen. Johnston		27500 p
May 1	Surrender of Gen. Morgan		1200 p
" 4	Surrender of Gen. Taylor.		10000 p
" 10	Surrender of Tallahassee Fl	70 k	8000 p
" 10	Near Boco, Chico, Tex.	70	
" 10	Capture of Jeff. Davis		
" 26	Surrender of Gen. Smith.		20000 p

In addition to the battles given above there were 421 minor battles, engagements and skirmishes.

Principal Naval Battles of the Civil War.

1862, Feb. 6—Fort Henry, Tenn., captured by Commodore Foote.

Feb. 8—Roanoke Island, N. C., captured by Commodore Goldsborough and Gen. Burnside.

16—Fort Donelson, Tenn., combined forces of Gen. Grant and Commodore Foote.

Mar. 8—Confederate ram Merrimac "sinks" U. S. Frigates Cumberland and Congress, Hampton Roads, Va.

9—Federal Monitor disables the Merrimac.

April 6—Pittsburgh Landing.

8—Capture of Island No. 10.

11—Fort Pulaski, Ga., captured by land and naval forces.

24—Forts Jackson, St. Phillip and New Orleans.

May 13—Natchez, Miss., captured by Admiral Farragut.

July 1—Malvern Hill.

1863, Jan. 11—Fort Hindman, Ark., Admiral Porter.

11—U. S. steamer Hatteras sunk by Confederate Alabama.

17—Monitor Weehawken captures Confederate ram Atlanta.

May 18—Vicksburg, Miss., Admiral Porter
July 8—Port Hudson, Miss., captured.
8—Natchez, Miss.
1864, June 19—U. S. steamer Kearsarge "sinks the Alabama" off Cherbourg, France.
Aug. 5—Mobile, Ala., Admiral Farragut.
1865, Jan. 15—Fort Fisher, N. C., captured by Gen. Terry and Commodore Porter.

During the Civil War the Federal Navy was increased in two years to over 400 vessels, the greater part of which were used in blockading Southern ports; notwithstanding their vigilance and effectiveness, many Confederate cruisers managed to escape the blockade and destroy the Northern merchant vessels.

At the present time (1880) not one-half the vessels belonging to the navy are in active service; the greater portion of those in commission are employed in what is called squadron service. There are seven squadrons, viz, the European, the Asiatic, the North Atlantic, the South Atlantic, the North Pacific, the South Pacific and the Gulf squadrons. These squadrons are under command of a high naval officer of the rank of commodore or rear admiral, whose ship is called the flag-ship of the squadron.

Federal Vessels Captured or Destroyed by Confederate "Cruisers."

Ships	80	Steamboats	4
Brigs	46	Gunboats	2
Barks	84	Cutter	1
Schooners	67	Tug	1

Vessels Captured or Destroyed for Violation of the Blockade, or in Battle, from May, 1861, to May, 1865.

Schooners	735	Gunboats	3
Sloops	155	Propellers	4
Steamers	262	Pilot boats	2
Barks	27	Boats	8
Brigs	30	Yachts	2
Ships	13	Tugs	3
Ironclads and rams	16	Barkentine	1
Brigantines	2	Pungy	1
		Miscellaneous	86

TIN, when compressed in powder, becomes solid under a pressure of ten tons on the square inch, zinc at thirty-eight tons, antimony at thirty-eight tons, aluminum at thirty-eight tons, bismuth at thirty-eight tons, and copper at thirty-three tons.

Cost of Recent Wars.

Crimean war	£340,000,000
Italian war of 1859	60,000,000
American civil war—North	940,000,000
" " " —South	460,000,000
Schleswig-Holstein war	7,000,000
Austrian and Prussian war, 1866	66,000,000
Expeditions to Mexico, Morocco, Paraguay, etc., (estimated)	40,000,000
Franco-Prussian war	500,000,000
Russian and Turkish war, 1877	210,000,000
Zulu and Afghan wars, 1879	30,000,000
	£2,653,000,000

This would allow $10 for every man, woman and child on the nabitable globe. It would make two railways all around the world at $250,000 per mile each. These figures are furnished by the Peace Society, London.

Losses from War in Twenty-Five Years (1855-80.)

	Killed in battle, or died of wounds and disease.
Crimean war	750,000
Italian war, 1859	45,000
War of Schleswig-Holstein	3,000
American civil war—the North	280,000
" " " —the South	200,000
War between Prussia, Austria and Italy, 1866.	45,000
Expeditions to Mexico, Cochin China, Morocco, Paraguay, etc	65,000
Franco-German war of 1870-71—France	155,000
" " " " "—Germany.	60,000
*Russian and Turkish war of 1877	225,000
Zulu and Afghan wars, 1879	40,000
Total	1,868,000

Length and Cost of American Wars.

Wars.	Length.	Cost.
1. War of the revolution	7 years—1775-1782	$ 135,193,703
2. Indian war in Ohio Ter.	1790	.....
3. War with the Barbary St	1803-1804	.....
4. Tecumseh Indian war	1811	.....
5. War with Great Britain.	3 years—1812-1815	107,159,003
6. Algerine war	1815	.....
7. First Seminole war	1817	.....
8. Black Hawk war	1832	.....
9. Second Seminole war	1845	.....
10. Mexican war	2 years—1846-1848	66,000,000
11. Mormon war	1856	.....
12. Civil war	4 years—1861-1865	$6,500,000,000

*About thirty thousand skeletons of Russian and Turkish soldiers were shipped to England in 1881, as manure, in the form of bones or bone d

The number placed *hors-de-combat* in battle are not relatively so large as formerly, as the table below will show:

	Men Engaged.	Hors-de-combat.	Ratio.
Thrasymene	65,000	17,000	27 per cent.
Cannæ	146,000	52,000	34 "
Bannockburn	135,000	38,000	28 "
Agincourt	62,000	11,400	18 "
Crecy	117,000	31,200	27 "
Marengo	58,000	13,000	22 "
Austerlitz	170,000	23,000	13 "
Borodino	250,000	78,000	31 "
Waterloo	145,000	51,000	35 "
Alma	103,000	8,400	8 "
Sadowa	402,000	33,000	8 "
Gravelotte	320,000	48,500	15 "
Gettysburg	140,000	8,000	5 "

According to Napoleon, the proportions of an army should be 70 per cent. infantry, 17 per cent. cavalry, and 13 per cent. between artillery, engineers and train.

The proportion of men capable of bearing arms is estimated at 25 per cent. of the population.

At the close of the Franco-German war the Germans took from the French 7.234 pieces of cannon, including 3,485 field pieces and 3,300 fortress guns. At the battle of Waterloo the British artillery fired 9,467 rounds, or one for every Frenchman killed.

The Decisive Battles of History.

Actium, B.C. 31. The combined fleets of Antony and Cleopatra defeated by Octavius, and imperialism established in the person of Octavius.

Philippi, B.C. 42. Brutus and Cassius defeated by Octavius and Antony. The fate of the Republic decided.

Metaurus, B.C. 207. The Carthaginians, under Hasdrubul, were defeated by the Romans, under Caius and Marcus Livius.

Arbela, B.C. 331. The Persians defeated by the Macedonians and Greeks under Alexander the Great. End of the Persian empire.

Syracuse, B.C. 414. The Athenians defeated by the Syracusans and their allies, the Spartans, under Gylippus.

Marathon, B.C. 490. The Athenians, under Miltiades, defeated the Persians under Datis. Free government preserved.

Winfeld-Lippe, A.D. 9. Teutonic independence established by the defeat of the Roman legions under Varus at the hands of the Germans under Arminius (Hermann).

Chalons, A.D. 451. The Huns, under Attila, called the

"Scourge of God," defeated by the confederate armies of Romans and Visigoths.

Tours, A.D. 732. The Saracens defeated by Charles Martel and Christendom rescued from Islam.

Hastings, A.D. 1066. Harold, commanding the English army, defeated by William the Conqueror, and a new regime established in England by the Normans.

Siege of Orleans, A.D. 1429. The English defeated by the French under Joan of Arc.

Defeat of the Spanish Armada, A.D. 1588. England saved from Spanish invasion.

Lutzen, A.D 1632. Decided the religious liberties of Germany Gustavus Adolphus killed.

Blenheim, A.D. 1704. The French and Bavarians, under Marshal Tallard, defeated by the English and their allies, under Marlborough.

Pultowa, A.D. 1709. Charles XII., of Sweden, defeated by the Russians under Peter the Great.

Saratoga, A.D. 1777. Critical battle of the American War of Independence. The English defeated by the Americans under Gen. Gates.

Valmy, A.D. 1792. An invading army of Prussians, Austrians and Hessians, under the Duke of Brunswick, defeated by the French under Kellermann. The first success of the Republic against foreigners.

Trafalgar. On the 21st of October, A.D. 1805, the great naval battle of Trafalgar was fought. The English defeated the French and destroyed Napoleon's hopes to successfully invade England.

Waterloo, A.D. 1815. The French, under Napoleon, defeated by the allied armies of Russia, Austria, Prussia and England, under Wellington.

Siege of Sebastopol, A.D. 1854–5. The Russians succumbed to the beleaguering armies of England, France and Turkey, and the result was delay in the expansion of the Russian Empire.

Gettysburg, July, A.D. 1863. The deciding battle of the war for the Union. The Confederates under Gen. Lee defeated by the Union forces under Meade.

Sedan, A.D. 1870. The decisive battle of the Franco-German war.

Slavery and Serfdom.

Some of the wealthy Romans had as many as 10,000 slaves. The minimum price fixed by the law of Rome was $80, but after great victories they could sometimes be bought for a few shillings on the field of battle. The day's wages of a Roman gardener were about 16 cents, and his value about $300, while a black-

smith was valued at about $700, a cook at $2,000, an actress at $4,000, and a physician at $11,000.

The number of slaves emancipated in the British Colonies in 1834 was 780,993, the indemnity aggregating, in round figures, $100,000,000. In Brazil, in 1876, there were 1,510,800 slaves, 15 per cent. of the entire population. These were held by 41,000 owners, averaging 37 to each owner. In 1882 the number of slaves was 1,300,000. Owing to the gradual abolition of slavery in Brazil by law it is expected that it will be entirely obsolete in 1900.

Slavery in the United States.

Year.	Number.	Year.	Number.
1790	697,900	1830	2,009,030
1800	893,040	1840	2,487,500
1810	1,191,400	1850	3,204,300
1820	1,538,100	1860	3,979,700

Serfdom in Russia.

There were 47,932,000 serfs in Russia in 1861, as follows: Crown serfs, 22,851,000; appanage, 3,326,000; held by nobles, 21,755,000. The cost of redemption was, in round numbers, about $325,000,000, as follows:

Mortgages remitted	$152,000,000
Government scrip	101,000,000
Paid by serfs	52,000,000
Balance due	20,000,000

The indemnity to the nobles was $15 per serf. The lands are mortgaged to the state till 1912. The lands ceded to Crown serfs are mortgaged only till 1901. The item of "mortgages remitted" is the amount due by nobles to the Imperial Bank and canceled.

Austrian Servitude (1840).

	Value.
Labor (two days per week)	$175,000,000
Tithe of crops, etc.	60,000,000
Male tribute, timber	7,000,000
Female tribute, spun wool	9,000,000
Fowl, eggs, butter	5,000,000
Total	$256,000,000

There were 7,000,000 serfs, whose tribute averaged more than $35 per head, which was, in fact, the rent of their farms. Some Bohemian nobles had as many as 10,000 serfs. The redemption was effected by giving the nobles 5 per cent. Government scrip, and land then rose 50 per cent. in value.

German Serfs.

In 1848 the state took 60,000,000 acres from the nobles, leaving them still 25,000,000 acres, and gave the former among the serfs. Indemnity as follows: 1. Government scrip, $900 for each serf family, to nobleman. 2. Land tax, $15 per annum, transferred to peasant. 3. Interest, $35 per annum for 47 years, to be paid by peasant to the state, being 4 per cent. on cost of redemption.

Famous Giants and Dwarfs.

The most noted giants of ancient and modern times are as follows:

Name.	Place.	Height, Feet.	Period.
Goliath	Palestine	11.0	B.C. 1063.
Galbara	Rome	9.9	Claudius Cæsar.
John Middleton	England	9.3	A.D. 1578.
Frederick's Swede	Sweden	8.4	.....
Cujanus	Finland	7.9	.....
Gilly	Tyrol	8.1	.....
Patrick Cotter	Cork	8.7	1806.
Chang Gow	Pekin	7.8	1880.

Many of the great men of history have been rather small in stature. Napoleon was only about 5 ft. 4 in., Washington was 5 ft. 7 in. One of the greatest of American statesmen, Alexander H. Stephens, never excelled 115 pounds in weight, and in his old age his weight was less than 100 pounds.

The more notable human mites are named below:

Name.	Height, inches.	Date of Birth.	Place of Birth.
Count Borowlaski	39	1739	Warsaw.
Tom Thumb(Chas. S. Stratton)	31	1837	New York.
Mrs. Tom Thumb	32	1842	"
Che-Mah	25	1838	China.
Lucia Zarate	20	1863	Mexico.
General Mite	21	1864	New York.

Evictions in Ireland.

The total number of families evicted in Ireland for 33 years is 482,000 as below:

Years.	Evicted.	Re-admitted.	Net Evictions.
1849–51	263,000	73,000	190,000
1852–60	110,000	28,000	82,000
1861–70	47,000	8,000	39,000
1871–80	41,000	6,000	35,000
1881–82	21,000	4,000	17,000
Total	482,000	119,000	363,000

The number of persons actually evicted was over two millions (say 70,000 per annum).

Great Financial Panics.

The most remarkable crises since the beginning of the present century have been as follows:

1814. England, 240 banks suspended.
1825. Manchester, failures 2 millions.
1831. Calcutta, failures,15 millions.
1837. United States, "Wild-cat" crisis; all banks closed.
1839. Bank of England saved by Bank of France. Severe also in France, where 93 companies failed for 6 millions.
1844. England. State loans to merchants. Bank of England reformed.
1847. England, failures 20 millions; discount 13 per cent.
1857. United States, 7,200 houses failed for 111 millions.
1866. London, Overend-Gurney crisis; failures exceeded 100 millions.
1869. Black Friday in New York (Wall street), September 24.

Excessive Heat in the Past.

In 1303 and 1304 the Rhine, Loire and Seine ran dry. The heat in several French provinces during the summer of 1705 was equal to that of a glass furnace. Meat could be cooked by merely exposing it to the sun. Not a soul dare venture out between noon and 4 p. m. In 1718 many shops had to close. The theaters never opened their doors for three months. Not a drop of water fell during six months. In 1773 the thermometer rose to 118 degrees. In 1778 the heat of Bologna was so great that a great number of people were stifled. There was not sufficient air for the breath, and people had to take refuge under the ground. In July, 1793, the heat again became intolerable. Vegetables were burned up, and fruit dried on the trees. The furniture and wood-work in dwelling-houses cracked and split up; meat went bad in an hour.

Summer Heat in Various Countries.

The following figures show the extreme summer heat in the various countries of the world: Bengal and the African desert, 150° Fahrenheit; Senegal and Guadaloupe, 130°; Persia, 125°; Calcutta and Central America, 120°; Afghanistan and the Arabian desert, 110°; Cape of Good Hope and Utah, 105°; Greece, 104°; Arabia, 103°; Montreal, 103°; New York, 102°; Spain, India, China, Jamaica, 100°; Sierra Leone, 94°; France, Denmark, St. Petersburg, Shanghai, the Burman Empire, Buenos Ayres, and the Sandwich Islands, 90°; Great Britain, Siam, and Peru, 85°; Portugal, Pekin and Natal, 80°; Siberia, 77°; Australia and Scotland, 75°; Italy, Venezuela and Madeira, 73°; Prussia and New Zealand, 70°; Switzerland and Hungary, 66°; Bavaria, Sweden, Tasmania and Moscow, 65°; Patagonia and the Falkland Isles, 55°; Iceland, 45°; Nova Zembla, 34°.

Severest Cold on Record.

1234. Mediterranean frozen; traffic with carts.
1420. Bosphorus frozen.
1468. Wine at Antwerp sold in blocks.
1658. Swedish artillery crossed the Sound.
1766. Snow knee-deep at Naples.
1789. Fahrenheit thermometer marked 23° below zero at Frankfort, and 36° below at Basle.
1809. Moscow, 48° below zero, greatest cold recorded there; mercury frozen.
1829. Jakoutsk, Siberia, 73° below zero on the 25th of January; greatest cold on record.
1846. December marked 25° below zero at Pontarlier; lowest ever marked in France.
1864. January, Fahrenheit stood at zero in Turin; greatest cold recorded in Italy.

Captain Parry, in his Arctic explorations, suffered for some time 51 degrees below zero. Frost is diminishing in Canada with the increase of population, as shown by the fact that Hudson's Bay was closed, from 1828–'37, 184 days per annum, and from 1871–'80 only 179 days per annum.

The Great Famines of History.

Walford mentions 160 famines since the 11th century, namely: England, 57; Ireland 34; Scotland, 12; France, 10; Germany, 11; Italy, etc., 36. The worst in modern times have been:

Country.	Date.	No. of Victims.
France	1770	48,000
Ireland	1847	1,029,000
India	1866	1,450,000

Deaths from hunger and want were recorded as follows in 1879, according to Mulhall: Ireland, 3,789; England, 312; London, 101; France, 260. The proportion per 1,000 deaths was, respectively, 37.6, .6, 1.2, .3.

Remarkable Plagues of Modern Times.

Date.	Place.	Deaths.	Weeks.	Deaths per Week.
1656	Naples	380,000	28	10,400
1665	London	68,800	33	2,100
1720	Marseilles	39,100	36	1,100
1771	Moscow	87,800	32	2,700
1778	Constantinople	170,000	18	9,500
1798	Cairo	88,000	25	3,500
1812	Constantinople	144,000	13	11,100
1834	Cairo	57,000	18	3,200
1835	Alexandria	14,900	17	900
1871	Buenos Ayres	26,300	11	2,400

Height of Noted Cathedrals, Monuments, etc.

	Feet.		Feet.
Eiffel Tower, Paris	989	Cathedral, Bologna	321
Washington Monument	555	" Norwich, Eng	309
Pyramid, Cheops, Egypt	543	" Chichester, Eng.	300
Cathedral, Cologne	511	" Lincoln, Eng	300
" Antwerp	476	Capitol, Washington	300
" Strasburg	474	St. James' Cathedral, Toronto.	316
Tower, Utrecht	464	Trinity Church, New York.	283
Steeple, St. Stephen's, Vienna	460	Cathedral, Mexico	280
Pyramid, Khafras, Egypt	456	" Montreal	280
St. Martin's Church, Bavaria.	456	Campanile Tower, Florence.	276
Chimney, Port Dundas, Glasgow	454	Column, Delhi	260
St. Peter's, Rome	448	Cathedral, Dantzic	250
Notre Dame, Amiens	422	Porcelain Tower, Nankin.	248
Salisbury Spire, England	406	Custom House, St. Louis	240
Cathedral, Florence	380	Canterbury Tower, Engl'd.	235
" Cremona	372	Notre Dame, Paris	232
" Freiburg	367	Chicago Board of Trade	230
St. Paul's, London	365	St. Patrick's, Dublin	226
Cathedral, Seville	369	Cathedral, Glasgow	225
Pyramid, Sakkarah, Egypt	356	Bunker Hill Monument	220
Cathedral, Milan	355	Notre Dame, Montreal	220
Notre Dame, Munich	348	Cathedral, Lima	220
Invalides, Paris	347	" Rheims	220
Parliament House, London	340	" Garden City, L. I.	219
Cathedral, Magdeburg	337	St. Peter and Paul, Phila	210
St. Patrick's, New York	328	Washington Mon., Balto	210
St. Mark's, Venice	328	Vendome Column, Paris	153

Principal of the Public Debt.

1855	July 1	$	35,586,858 56	1872	July 1	$	2,253,251,328 78
1856	"		31,972,537 90	1873	"		2,234,482,993 20
1857	"		28,699,831 85	1874	"		2,251,690,468 43
1858	"		44,911,881 03	1875	"		2,232,284,531 95
1859	"		58,496,837 88	1876	"		2,180,395,067 15
1860	"		64,842,287 88	1877	"		2,205,301,392 10
1861	"		90,580,873 72	1878	"		2,256,203,892 53
1862	"		524,176,412 13	1879	"		2,245,495,072 04
1863	"		1,119,772,138 63	1880	"		2,120,415,370 63
1864			1,815,784,370 57	1881	"		2,069,013,569 58
1865	"		2,680,647,869 74	1882	"		1,918,312,994 03
1866	"		2,773,236,173 69	1883	"		1,884,171,728 07
1867	"		2,678,126,103 87	1884	"		1,830,528,923 57
1868	"		2,611,687,851 19	1885	"		1,876,424,275 14
1869	"		2,588,452,213 94	1886	"		1,756,445,205 78
1870	"		2,480,672,427 81	1887	Dec. 1		1,664,461,536 38
1871	"		2,353,211,332 32	1888	"		1,680,917,706 23
				1890	Dec. 1		1,547,296,426 00

	Churches.	Ministers.	Communicants.
Adventists	1,344	775	91,769
Baptists	37,156	26,545	3,336,553
Congregationalists	3,936	8,723	387,619
Friends	392	200	96,000
German Evangelical Church	550	430	80,000
Lutherans	6,130	3,429	785,987
Methodists	41,271	24,485	3,943,875
Mennonites	500	450	80,000
Moravians	84	70	9,928
New Jerusalem	87	92	3,994
Presbyterians	11,783	8,834	966,437
Protestant Episcopal	3,109	3,664	351,699
Reformed	1,942	1,320	243,825
Roman Catholics	6,241	6,546	6,832,954
Schwendfeldians	.....	.....	700
Unitarians	362	434	20,000
Universalists	719	713	36,238
Total in United States	115,610	81,717	17,267,878

Indian Country.

The entire extent of territory now in a state of reservation for Indian purposes, including all portions of the Indian Territory, whether in fact occupied or unoccupied by Indians, is 112,413,440 acres, being equivalent to an average of 456 acres for each Indian, computed on the last reported number of the total population, including those estimated as outside the reservations. Of this area about 81,020,129 acres are within the scope of the general allotment law of 1887, and afford an average for the population residing upon such lands, amounting to 173,985, of about 465 acres to each. It will be seen that, by the execution of the general allotment law and breaking up of the reservations, a wide area of the public domain will be opened to settlement.

The Cherokees, Creeks, Choctaws, Chickasaws, and Seminoles, constituting the five civilized tribes; the Osages, Miamis, Peorias, and Sacs and Foxes of the Indian territory, and the Seneca nation in New York are excepted from the provisions of the allotment act. The territory occupied by them embraces 21,969,695 acres, not counting therewith the 6,024,239 acres of the Cherokee outlet, the 1,887,801 acres known as Oklahoma, and the 1,511,576 acres lying in the Indian territory south of the north fork of the Red river. The number of these excepted Indians is shown by the reports to be 72,110 in all.

Land Monopoly.

The following is a table of the leading alien holders of lands in the United States, with amount of holdings in acres:

An English syndicate, No. 3, in Texas	3,000,000
The Holland Land Co., New Mexico	4,500,000
Sir Edw. Reid and a syndicate, Florida	2,000,000
English syndicate in Mississippi	1,800,000
Marquis of Tweedale	1,750,000
Phillips, Marshall & Co., London	1,300,000
German-American syndicate, London	750,000
Bryan H. Evans, of London	700,000
Duke of Sutherland	425,000
British Land Company in Kansas	320,000
Wm. Wharley, M. P., Peterboro, Eng	310,000
Missouri Land Co., Edinburgh, Scotland	300,000
Robert Tennent, of London	230,000
Dundee Land Co., Scotland	247,000
Lord Dunmore	120,000
Benjamin Neugas, Liverpool	100,000
Lord Houghton in Florida	60,000
Lord Dunraven in Colorado	60,000
English Land Company in Florida	50,000
English Land Company in Arkansas	50,000
Albert Peel, M. P., Leicestershire, Eng	10,000
Sir J. L. Kay, Yorkshire, Eng	5,000
Alexander Grant, of London, in Kans	35,000
English syndicate, Wisconsin	110,000
M. Ellerhauser, of Halifax, in W. Va	600,000
A Scotch syndicate in Florida	500,000
A. Boysen, Danish consul in Milwaukee	50,000
Missouri Land Company, of Edinburgh	165,000
Total	20,647,000

To these syndicate holdings should be added the following: The Arkansas Valley Company in Colorado, a foreign corporation, whose inclosures embrace upward of 1,000,000 acres; the Prairie Cattle Company (Scotch) in Colorado, upwards of 1,000,000; H. H. Metcalf, River Bend, Col., 200,000; John W. Powers, Colorado, 200,000; McDaniel & Davis, Colorado, 75,000; Routchler & Lamb, Colorado, 40,000; J. W. Frank, Colorado, 40,000; Garnett & Langford, Colorado, 30,000; E. C. Tane, Colorado, 50,000; Leivesy Brothers, Colorado, 150,000; Vrooman & McFife, Colorado, 50,000; Beatty Brothers, Colorado, 40,000; Chick, Brown & Co., Colorado, 30,000; Reynolds Cattle Company, Colorado, 50,000; several other cases in Colorado, embracing from 10,000 to 30,000; Coe & Carter, Nebraska, fifty miles of fence; J. W. Wilson, Nebraska, forty miles; J. W. Boster, twenty miles; William Humphrey, Nevada, thirty miles; Nelson & Son, Nevada, twenty-two miles; Kennebec Ranch, Nebraska, from 20,000 to 50,000 acres.

The American Indian.

The total Indian population of the United States in 1887, exclusive of Alaska, was 247,761.

The Indian reservations in 1886 amounted to 135,978,345 acres, or 212,466 square miles approximately.

The popular idea that there was originally a large Indian population in the territory now covered by the United States, and that the numbers have decreased with each succeeding generation, as it came in contact with the fire-arms and fire-water of the white man's civilization, is probably erroneous. There are no statistics available, but careful observation and comparison has induced such students of Indian history as Mr. J. P. Dunn, Jr., to fix the Indian population of our present Territory, at the time of European colonization, at 530,000 approximately, and Mr. Elbridge S. Brooks, the latest writer upon the Indians, materially modifies those figures, expressing the opinion that in 1600 there were not over half a million of Indians between the shores of the Gulf of Mexico and the Arctic Ocean, and, in fact, that the Indian population of today is substantially the same in volume that it was when Columbus discovered America, or Leif Ericson either.

Illiteracy.

The 1880 census enumerates 36,761,607 persons of ten years of age and upward. Of this number 4,923, 451, or 13.4 per cent., are returned as unable to read, and 6,239,958, or 17 per cent., as unable to write. The following States show over 40 per cent. of their population as unable to write: Alabama, 60; Florida, 43; Georgia, 50; Louisiana, 49; Mississippi, 50; New Mexico, 65; North Carolina, 48; South Carolina, 55; and Virginia, 41, and the following States with less than 5 per cent. unable to read: Connecticut, 4; Dakota, 3; Illinois, 4; Indiana, 5; Iowa, 2; Kansas, 4; Maine, 4; Michigan, 4; Minnesota, 4; Montana, 5; Nebraska, 2½; New Hampshire, 4; New Jersey, 5; New York, 4; Ohio, 4; Oregon, 4; Pennsylvania, 5; Utah, 5; Virginia, 5, and Wisconsin, 4.

Average of Import Duties in Various Countries.

	Ratio to Imports. Per Cent.		Ratio to Imports Per Cent
United Kingdom	5½	Belgium	1½
France	6½	Denmark	9
Germany	6	Sweden and Norway	12
Russia	18	Europe	7¼
Austria	5	United States	28
Italy	11	Canada	15
Spain	24	Australia	13
Portugal	26	Brazil	44
Holland	1	Argentine Republic	37

Organized Labor in the United States.

The first strike in this country occurred in New York City in 1803, when a number of sailors struck for an advance of wages.

1806. The tailors this year established the first organization in the United States, in the present form of a trades union.

1819. The hatters organized a union of their craft.

1825–30. The Columbia Charitable Association of Shipwrights and Caulkers was organized.

1825. As early as this year the questions of shorter hours of work, better wages and protection of operatives in factories were being agitated, and during the years that immediately followed, social unions of different crafts were springing up in cities and manufacturing centers.

1828. The Workingmen's Party, a local political organization in New York, Boston, Philadelphia and other cities, appeared.

1829. At the State election in New York a workingmen's ticket was put in the field, and elected one candidate to the Legislature—Ebenezer Ford, of New York.

1831. First local unions of printers.

1831. The New England Association of Farmers, Mechanics and Workingmen formed.

1832. Ten-hour movement among the shipwrights and caulkers throughout New England cities was followed by strikes, which proved unsuccessful.

1834. A mechanics' convention met at Utica, N. Y., and protested against convict labor.

1835. From this year onward strikes occurred in the different trades from time to time, with varying results.

1840. About this time many trades were organized, and some were enrolled in Labor Reform associations.

1840. President Van Buren established the ten-hour system for all employes of the Government in the Navy Yards.

1844–45. First effort of co-operation in connection with the labor movement originated in Boston.

1845. The New England Workingmen's Association was organized in Boston.

1845, October 12. The first Industrial Congress of the United States convened in New York.

1847. New Hampshire passed a law making ten hours a legal day's work.

1850. The labor agitation at this period was principally directed to a reduction in hours of work by legal enactment. It entered into politics and many candidates were run on that issue.

1850–60. National and international trades unions were organized, granting charters to local bodies and organizing new branches, from Maine to California.

1861–65. The eight-hour movement obtained great impetus during the war.

1866. There was a revival of the labor movement, and many new organizations were formed.

1864. The Cigarmakers' International Union was formed.

1866. An eight-hour bill for the benefit of Government employes was introduced in Congress, and finally became a law in 1868 by the signature of President Johnson.

1866. First National Labor Congress met at Baltimore, August 20. This body met annually in different cities for several years.

1869. The Knights of Labor were organized in Philadelphia.

The labor movement from 1870 to the present time has been a continuous growth in the number of trades unions and increase in their membership, attended by strikes, lock-outs and settlements by arbitration, the agitation for labor legislation and efforts at political party organization. Congress created a National Bureau of Labor in 1884.

Most of the trades unions organizations in the United States were represented at a convention held at Columbus, O., in December, 1886, when a national organization was formed, a constitution adopted and the title taken of The American Federation of Labor. This body and the Order of Knights of Labor of America (which is a secret order) are the two principal national labor organizations of the United States.

THE total number of newspapers published in the world at present is estimated at about 40,000, distributed as follows; United States, 15,000; Germany, 5,500; Great Britain, 5,000, France, 4,092; Japan, 2,000; Italy, 1,400; Austria-Hungary, 1,200; Asia, exclusive of Japan, 1,000; Spain, 850; Russia, 800; Australia, 700; Greece, 600; Switzerland, 450; Holland, 300; Belgium, 300; all others, 1,000. Of these about half are printed in the English language.

COAL IN THE UNITED STATES.—This country has an area of between 300,000 and 400,000 square miles of known coal fields, from which 1 million tons is mined yearly—enough to belt the earth at the equator with a ring five and a half feet thick by five and a half feet wide. The quantity "in sight" is estimated to be sufficient to supply the whole world for a period of fifteen hundred to two thousand years.

ROMAN money mentioned in the New Testament, reduced to English and American standard:

	£	s.	d.	far.	$	cts.
A mite	0	0	0	0.75	0	00.354
A farthing, about	0	0	0	1.50	0	00.687
A penny, or denarius	0	0	7	2.	0	13.75
A pound, or mina	3	2	6	0.	13	75.

PARLIAMENTARY LAW AT A GLANCE.

List of Motions Arranged According to their Purpose and Effect.

[Letters refer to rules below.]

Modifying or amending.									
8. To amend or to substitute, or to divide the question									K
To refer to committee.									
7. To commit (or recommit)									D
Deferring Action.									
6. To postpone to a fixed time									C
4. To lay on the table							A	E	G
Suppressing or extending debate.									
5. For the previous question							A	E	M
To limit, or close, debate								A	M
To extend limits of debate									A
Suppressing the question.									
Objection to consideration of question						A	H	M	N
9. To postpone indefinitely								D	E
4. To lay upon the table							A	E	G
To bring up a question the second time.									
To reconsider { debatable question						D	E	F	I
To reconsider { undebatable question						A	E	F	I
Concerning Orders, Rules, etc.									
3. For the orders of the day						A	E	H	N
To make subject a special order									M
To amend the rules									M
To suspend the rules						A	E	F	M
To take up a question out of its proper order								A	E
To take from the table							A	E	G
Questions touching priority of business									A
Questions of privilege.									
Asking leave to continue speaking after indecorum									A
Appeal from chair's decision touching indecorum						A	E	H	L
Appeal from chair's decision generally							E	H	L
Question upon reading of papers								A	E
Withdrawal of a motion								A	E
Closing a meeting.									
2. To adjourn (in committees, to rise), or to take a recess, without limitation							A	E	F
1. To fix the time to which to adjourn									B

Order of Precedence.—*The motions above numbered 1 to 9 take precedence over all others in the order given, and any one of them, except to amend or substitute, is in order while a motion of a lower rank is pending.*

RULE A. Undebatable, but remarks may be tacitly allowed.

RULE B. Undebatable if another question is before the assembly.

RULE C. Limited debate allowed on propriety of postponement only.

RULE D. Opens the main question to debate. Motions not so marked do not allow of reference to main question.

RULE E. Cannot be amended. Motion to adjourn can be amended when there is no other business before the house.

RULE F. Cannot be reconsidered.

RULE G. An affirmative vote cannot be reconsidered.

RULE H. In order when another has the floor.

RULE I. A motion to reconsider may be moved and entered when another has the floor, but the business then before the house may not be set aside. This motion can only be entertained when made by one who voted originally with the prevailing side. When called up it takes precedence of all others which may come up, excepting only motions relating to adjournment.

RULE K. A motion to amend an amendment cannot be amended.

RULE L. When an appeal from the chair's decision results in a tie vote, the chair is sustained.

RULE M. Requires a two-thirds vote unless special rules have been enacted.

RULE N. Does not require to be seconded.

GENERAL RULES.

No motion is open for discussion until it has been stated by the chair.

The maker of a motion cannot modify it or withdraw it after it has been stated by the chair, except by general consent.

Only one reconsideration of a question is permitted.

A motion to adjourn, to lay on the table, or to take from the table, cannot be renewed unless some other motion has been made in the interval.

On motion to strike out the words, "Shall the words stand part of the motion?" unless a majority sustains the words, they are struck out.

On motion for previous question, the form to be observed is, "Shall the main question be now put?" This, if carried, ends debate.

On an appeal from the chair's decision, "Shall the decision be sustained as the ruling of the house?" The chair is generally sustained.

On motion for orders of the day, "Will the house now proceed to the orders of the day?" This, if carried, supersedes intervening motions.

When an objection is raised to considering questions, "Shall the question be considered?" objections may be made by any member before debate has commenced, but not subsequently.

LETTER COMBINATIONS.—When King Stanislaus of Poland, then a young man, came back from a journey, the whole Lescinskian House gathered together at Lissa to receive him. The schoolmaster, Jablowsky, prepared a festival in commemoration of the event, and had it end with a ballet performed by thirteen students, dressed as cavaliers. Each had a shield, upon which one of the letters of the words "*Domus Lescinia*" (The Lescinskian House) was written in gold. After the first dance, they stood in such a manner that their shields read "*Domus Lescinia*;" after the second dance, they changed order, making it read, "*Ades incolumis*" (Unharmed art thou here); after the third, "*Mane sidus loci*" (Continue the star of this place); after the fourth, "*Sis columna Dei*" (Be a pillar of God); and finally, "*I! scande solium!*" (Go! ascend the throne). Indeed, these two words allow of 1,556,755,200 transpositions; yet that four of them convey independent and appropriate meanings is certainly very curious.

TO TELL PURE WATER.—The color, odor, taste and purity of water can be ascertained as follows: Fill a large bottle made of colorless glass with water; look through the water at some black object. Pour out some of the water and leave the bottle half full; cork the bottle and place it for a few hours in a warm place; shake up the water, remove the cork, and critically smell the air contained in the bottle. If it has any smell, particularly if the odor is repulsive, the water should not be used for domestic purposes. By heating the water an odor is evolved that would not otherwise appear. Water fresh from the well is usually tasteless, even if it contains a large amount of putrescible organic matter. All water for domestic purposes should be perfectly tasteless, and remain so even after it has been warmed, since warming often develops a taste in water which is tasteless when cold.

HAND GRENADES.—Take chloride of calcium, crude, 20 parts; common salt, 5 parts; and water, 75 parts. Mix and put in thin bottles. In case of fire, a bottle so thrown that it will break in or very near the fire will put it out. This mixture is better and cheaper than many of the high-priced grenades sold for the purpose of fire protection.

HOW TO GET RID OF RATS.—Get a piece of lead pipe and use it as a funnel to introduce about 1½ ounces of sulphide of potassium into any outside holes tenanted by rats, not to be used in dwellings. To get rid of mice use tartar emetic mingled with any favorite food; they will eat, sicken and take their leave.

Great Fires and Conflagrations.

London, Sept. 2–6, 1666.—Eighty-nine churches, many public buildings and 13,200 houses destroyed; 400 streets laid waste; 200,000 persons homeless. The ruins covered 436 acres.

New York, Dec. 16, 1835.—600 buildings; loss, $20,000,000. Sept. 6, 1839.—$10,000,000 worth of property.

Pittsburgh, April 10, 1845.—1,000 buildings; loss, $6,000,000.

Philadelphia, July 9, 1850.—350 buildings; loss, $1,500,000; 25 persons killed; 9 drowned; 120 wounded.

St. Louis, May 4, 1851.—Large portion of the city burned; loss, $15,000,000.

San Francisco, May 3–5, 1851.—2,500 buildings; loss, $3,500,000; many lives lost. June 22, 1851.—500 buildings; loss, $3,000,000.

Santiago (Spain), Dec. 8, 1863.—A fire in the church of the Campania, beginning amid combustible ornaments; 2,000 persons killed, mostly women.

Charleston, S. C., Feb. 17, 1865.—Almost totally destroyed, with large quantities of naval and military stores.

Richmond, Va., April 2 and 3, 1865.—In great part destroyed by fire at time of Confederate evacuation.

Portland, Me., July 4, 1866.—Almost entirely destroyed; loss, $15,000,000.

Chicago, Oct. 8 and 9, 1871.—3½ square miles laid waste; 17,450 buildings destroyed; 200 persons killed; 98,500 made homeless. July 14, 1874.—Another great fire; loss, $4,000,000.

Great forest fires in Michigan and Wisconsin, October 8–14, 1871.—2,000 lives lost.

Boston, Nov. 9–11, 1872.—800 buildings; loss, $73,000,000; 15 killed.

Fall River, Mass., Sept. 19, 1874.—Great factory fires; 60 persons killed.

St. John, N. B., June 21, 1876.—Loss, $12,500,000.

Brooklyn Theater burned, Dec. 5, 1876.—300 lives lost.

Seattle and Spokane, Wash., 1889.—About $10,000,000 each.

Great Floods and Inundations.

An inundation in Cheshire, England, A.D. 353.—3,000 persons perished.

Glasgow, A.D. 758.—More than 400 families drowned.

Dort, April 17, 1421.—72 villages submerged; 100,000 people drowned.

Overflow of the Severn, A.D. 1483, lasting ten days.—Men, women and children carried away in their beds, and the waters covered the tops of many mountains.

General inundation in Holland, A.D. 1530.—By failure of dikes: 400,000 said to have been drowned.

At Catalonia, A.D. 1617.—50,000 drowned.

Johnstown, Pa., May 31, 1889.—By the bursting of a huge reservoir on the mountains, the town was almost entirely destroyed, and about 6,000 persons perished. The water in its passage to Johnstown descended about 250 feet. The theoretical velocity due to this descent would be about 127 feet per second or between 86 and 87 miles an hour. According to the best accounts from 15 to 17 minutes were occupied in the passage to Johnstown, a distance of about twelve miles. Thus the average velocity could not have been far short of 50 miles an hour. The impetus of such a mass of water was irresistible. As the flood burst through the dam it cut trees away as if they were stalks of mullein.

A HAWK flies 150 miles per hour; an eider duck, 90 miles; a pigeon, 40 miles.

A MAN'S working life is divided into four decades; 20 to 30, bronze; 30 to 40, silver; 40 to 50, gold; 50 to 60, iron. Intellect and judgment are strongest between 40 and 50.

HAIR which is lightest in color is also lightest in weight. Light or blonde hair is generally the most luxuriant, and it has been calculated that the average number of hairs of this color on an average person's head is 140,000; while the number of brown hairs is 110,000, and black only 103,000.

GOLDSMITH received $300 for the "Vicar of Wakefield;" Moore, $15,500 for "Lalla Rookh;" Victor Hugo, $12,000 for "Hernani;" Chateaubriand, $110,000 for his works; Lamartine, $16,000 for "Travels in Palestine;" Disraeli, $50,000 for "Endymion;" Anthony Trollope, $315,000 for forty-five novels; Lingard, $21,500 for his "History of England;" Mrs. Grant received over $600,000 as royalty from the sale of "The Personal Memoirs of U. S. Grant."

ONE woman in 20, one man in 30 is barren—about 4 per cent. It is found that one marriage in 20 is barren—5 per cent. Among the nobility of Great Britain, 21 per cent. have no children, owing partly to intermarriage of cousins, no less than 4½ per cent. being married to cousins.

THE capital employed in banking in the principal countries is as follows: Great Britain, $4,020,000,000; United States, $2,655,000,000; Germany, $1,425,000,000; France. $1,025,000,000; Austria, $830,000,000; Russia, $775,000,000; Italy, $455,000,000; Australia, $425,000,000; Canada, $175,000,000.

THE largest bells are the following, and their weight is given in tons: Moscow, 216; Burmah, 117; Pekin, 53; Novgorod, 31; Notre Dame, 18; Rouen, 18; Olmutz, 18; Vienna, 18; St. Paul's, 16; Westminster, 14; Montreal, 12; Cologne, 11; Oxford, 8; St. Peter's, 8.

Bell-metal should have 77 parts copper, and 23 tin.

AMERICAN life average for professions (Boston): Storekeepers, 41.8 years; teamsters, 43.6 years; laborers, 44.6 years; seamen, 46.1 years; mechanics, 47.3 years; merchants, 48.4 years; lawyers, 52.6 years; farmers, 64.2 years.

IN THE SMALL-POX epidemic of 1881, in England, the returns showed 4,478 deaths per million inhabitants—98 vaccinated to 4,380 unvaccinated, or in the proportion of 44 to 1. In the epidemic at Leipsic in 1871, the death rate was 12,700 per million, 70 per cent. of whom were unvaccinated. These figures are by Dr. Mulhall. In Boston the proportion was 15 to 50, and in Philadelphia, 17 to 64.

During the Franco-German war the Germans lost only 263 men from this disease, the French 23,499, the former having been revaccinated in barracks. In the war in Paraguay, the Brazilians lost 43,000 men from malignant or black small-pox, that is, 35 per cent. of their army, nine cases in ten proving fatal.

A CAMEL has twice the carrying power of an ox; with an ordinary load of 400 lbs. he can travel 12 to 14 days without water, going 40 miles a day. Camels are fit to work at 5 years old, but their strength begins to decline at 25, although they live usually till 40.

THE CHECKS paid in New York and London in one month aggregate $6,350,000,000, which is greatly in excess of the value of all the gold and silver coin in existence.

POUNDS of water evaporated by 1 lb. of fuel as follows: Straw, 1.9; wood, 3.1; peat, 3.8; coke or charcoal, 6.4; coal, 7.9; petroleum, 14.6.

IN 1877 the newspaper *Nationale* of Paris had ten pigeons which carried dispatches daily between Versailles and Paris in fifteen to twenty minutes. In November, 1882, some pigeons, in face of a strong wind, made the distance of 160 miles, from Canton Vaud to Paris, in 6½ hours, or 25 miles per hour.

THE average elevation of continents above sea level is: Europe, 670 feet; Asia, 1,140 feet; North America, 1,150 feet; South America, 1,100 feet.

IN 1684, four men were taken alive out of a mine in England, after 24 days without food. In 1880, Dr. Tanner, in New York, lived on water for 40 days, losing 36 lbs. in weight.

THE fair of Nijni-Novgorod is the greatest in the world, the value of goods sold being as follows: 1841, $35,000,000; 1857, $60,000,000; 1876, $140,000,000; the attendance in the last named year including 150,000 merchants from all parts of the world. In that of Leipsic the annual average of sales is $20,000,000, comprising 20,000 tons of merchandise, of which two-fifths is books.

THE average annual production of flax is as follows: Russia, 270,000 tons; Austria, 53,000; Germany, 48,000; Belgium and Holland, 38,000; France, 37,000; United Kingdom, 25,000; Italy, 23,000; United States, 12,000; Scandinavia, 4,000—total, 510,000 tons.

A BODY weighing 140 lbs. produces 3 lbs. ashes; time for burning, 55 minutes.

THE six largest diamonds in the world weigh, respectively, as follows: Kohinoor, 103 carats; Star of Brazil, 125 carats; Regent of France, 136 carats; Austrian Kaiser, 139 carats; Russian Czar, 193 carats; Rajah of Borneo, 367 carats. The value of the above is not regulated by size, nor easy to estimate, but none of them is worth less than $500,000.

ACCORDING to Orfila, the proportion of nicotine in Havana tobacco is 2 per cent.; in French, 6 per cent., and in Virginia tobacco, 7 per cent. That in Brazilian is still higher.

THERE were 2,180 lepers in Norway in 1883, according to Mulhall. The numbers in Spain and Italy are considerable. In the Sandwich Islands the disease is so prevalent that the island of Molokai is set apart for lepers, who are under the direction of a French Jesuit priest. The death of Father Damien, in 1889, called attention to the noblest instance of self-sacrifice recorded in the nineteenth century. His place is now filled by a younger member of his order, who voluntarily sacrifices his health and life to aid the outcasts. In the Seychelles Islands leprosy is also common.

ONE horse-power will raise 16½ tons per minute a height of 12 inches, working 8 hours a day. This is about 9,900 foot-tons daily, or 12 times a man's work.

THE horse-power of Niagara is 3¼ million nominal, equal to 10 million horses effective.

GOOD clear ice two inches thick will bear men to walk on; four inches thick will bear horses and riders; six inches thick will bear horses and teams with moderate loads.

THE percentage of illegitimate births for various countries, as stated by Mulhall, is as follows: Austria, 12.9; Denmark, 11.2; Sweden, 10.2; Scotland, 8.9; Norway, 8.05; Germany, 8.04; France, 7.02; Belgium, 7.0; United States, 7.0; Italy, 6.8; Spain and Portugal, 5.5; Canada, 5.0; Switzerland, 4.6; Holland, 3.5; Russia, 3.1; Ireland, 2.3; Greece, 1.6.

INDIA RUBBER is obtained mostly from the Seringueros of the Amazon, who sell it for about 12 cents a pound to the merchants of Para, but its value on reaching England or the United States is over 50 cents a pound. The best rubber forests in Brazil will ultimately be exhausted, owing to the reckless mode followed by the Seringueros, or tappers. The ordinary product of a tapper's work is from 10 to 16 lbs. daily. There are 120 india rubber manufacturers in the United States, employing 15,000 operatives, who produce 280,000 tons of goods, valued at $260,000,000 per annum.

ONE pair of rabbits can become multiplied in four years into 1,250,000. They were introduced in Australia a few years ago, and now that colony ships 6,000,000 rabbit skins yearly to England.

THE largest of the Pyramids, that of Cheops, is composed of four million tons of stone, and occupied 100,000 men during 20 years, equal to an outlay of $200,000,000. It would now cost $20,000,000 at a contract price of 36 cents per cubic foot.

ONE tug on the Mississippi can take, in six days, from St.

Louis to New Orleans, barges carrying 10,000 tons of grain, which would require 70 railway trains of fifteen cars each. Tugs in the Suez Canal tow a vessel from sea to sea in 44 hours.

COMPARATIVE SCALE OF STRENGTH.—Ordinary man, 100; Byron's Gladiator, 173; Farnese Hercules, 362; Horse, 750.

A MAN will die for want of air in five minutes; for want of sleep, in ten days; for want of water, in a week; for want of food, at varying intervals, dependent on various circumstances.

THE average of human life is 33 years. One child out of every four dies before the age of 7 years, and only one-half of the world's population reach the age of 17. One out of 10,000 reaches 100 years. The average number of births per day is about 120,000, exceeding the deaths by about 15 per minute. There have been many alleged cases of longevity in all ages, but only a few are authentic.

THE ratio of sickness rises and falls regularly with death rate in all countries, as shown by Dr. Farr and Mr. Edmonds at the London Congress of 1860, when the following rule was established: Of 1,000 persons, aged 30, it is probable 10 will die in the year, in which case there will be 20 of that age sick throughout the year, and 10 invalids. Of 1,000 persons, aged 75, it is probable that 100 will die in the year, in which case the sick and invalids of that age will be 300 throughout the year. For every 100 deaths let there be hospital beds for 200 sick, and infirmaries for 100 invalids.

THE estimated number of religious denominations among English-speaking communities throughout the world is as follows: Episcopalians, 21,100,000; Methodists of all descriptions, 15,800,000; Roman Catholics, 14,340,000; Presbyterians of all descriptions, 10,500,000; Baptists of all descriptions, 8,160,000; Congregationalists, 6,000,000; Unitarians, 1,000,000; Free Thought, 1,100,000; minor religious sects, 2,000,000; of no particular religion, 20,000,000. Total English speaking population, 100,000,000.

THE various nations of Europe are represented in the list of Popes as follows: English, 1; Dutch, 1; Swiss, 1; Portuguese, 1; African, 2; Austrian, 2; Spanish, 5; German, 6; Syrian, 8; Greek, 14; French, 15; Italian, 197. Eleven Popes reigned over 20 years; 69, from 10 to 20; 57, from 5 to 10; and the reign of 116 was less than 5 years. The reign of Pius IX. was the longest of all, the only one exceeding 25 years. Pope Leo XIII. is the 258th Pontiff. The full number of the Sacred College is 70, namely: Cardinal Bishops, 6; Cardinal Priests, 50; Cardinal Deacons, 14. At present there are 62 Cardinals. The Roman Catholic hierarchy throughout the world, according to official

returns published at Rome in 1884, consisted of 11 Patriarchs, and 1,153 Archbishops and Bishops. Including 12 coadjutor or auxiliary bishops, the number of Roman Catholic archbishops and bishops now holding office in the British Empire is 134. The numbers of the clergy are approximate only.

CONSUMPTION.—Of the total number of deaths the percentage traceable to consumption in the several States and Territories is as follows: Alabama, 9.6; Arizona, 6.1; Arkansas, 6.4; California, 15.6; Colorado, 8.2; Connecticut, 15.1; Dakota, 8.8; Delaware, 16.1; District of Columbia, 18.9; Florida, 8.3; Georgia, 7.9; Idaho, 6.8; Illinois, 10.3, Indiana, 12.6; Iowa, 9.9; Kansas, 7.3; Kentucky, 15.7; Louisiana, 10.4; Maine, 19.2; Maryland, 14.0; Massachusetts, 15.7; Michigan, 13.2; Minnesota, 9.3; Mississippi, 8.8; Missouri, 9.8; Montana, 5.6; Nebraska, 8.8; Nevada, 6.3; New Hampshire, 5.6; New Jersey, 8.9; New Mexico, 2.4; New York, 8.1; North Carolina, 9.5; Ohio, 13.8; Oregon, 12.1; Pennsylvania, 12.6; Rhode Island, 14.6; South Carolina, 9.8; Tennessee, 14.5; Texas, 6.5; Utah, 2.8; Vermont, 16.1; Virginia, 12.2; Washington, 13.2; West Virginia, 13.0; Wisconsin, 10.4; Wyoming, 2.6; Average, 12.0.

CAPACITY of the largest public buildings in the world: Coliseum, Rome, 87,000; St. Peter's, Rome, 54,000; Theater of Pompey, Rome, 40,000; Cathedral, Milan, 37,000; St. Paul's, Rome, 32,000; St. Paul's, London, 31,060; St. Petronia, Bologna, 26,000; Cathedral, Florence, 24,300; Cathedral, Antwerp, 24,000; St. John Lateran, Rome, 23,000; St. Sophia's, Constantinople, 23,000; Notre Dame, Paris, 21,500; Theater of Marcellus, Rome, 20,000; Cathedral, Pisa, 13,000; St. Stephen's, Vienna, 12,400; St. Dominic's, Bologna, 12,000; St. Peter's, Bologna, 11,400; Cathedral, Vienna, 11,000; Gilmore's Garden, New York, 8,443; La Scala, Milan, 8,000; Auditorium, Chicago, 7,000; Mormon Temple, Salt Lake City, 8,000; St. Mark's, Venice, 7,500; Spurgeon's Tabernacle, London, 6,000; Bolshoi Theater, St. Petersburg, 5,000; Tabernacle (Talmage's), Brooklyn, 5,000; Music Hall, Cincinnati, 4,824.

THERE are 3,000,000 opium smokers in China. A paper read before the New York Medical Society by Dr. F. N. Hammond presents some important facts. In 1840 about 20,000 pounds of opium were consumed in the United States; in 1880, 533,450 pounds. In 1868 there were about 90,000 habitual opium-eaters in the country, now they number over 500,000. More women than men are addicted to the use of the drug. The vice is one so easily contracted, so easily practiced in private, and so difficult of detection, that it presents peculiar temptations and is very insiduous. The relief from pain that it gives and the peculiar exaltation of spirits easily lead the victim to believe that the use

of it is beneficial. Opium and chloral are today the most deadly foes of women. Dr. Hammond is the better qualified to speak on this subject from having once been a consumer of opium himself. To break off from the habit, he says, the opium-eater must reduce the quantity of his daily dose, using at the same time other stimulants, and gradually eliminate the deadly drug entirely.

THE degrees of alcohol in wines and liquors are: Beer, 4.0; porter, 4.5; ale, 7.4; cider, 8.6; Moselle, 9.6; Tokay, 10.2; Rhine, 11.0; Orange, 11.2; Bordeaux, 11.5; hock, 11.6; gooseberry, 11.8, Champagne, 12.2; claret, 13.3; Burgundy, 13.6; Malaga, 17.3; Lisbon, 18.5; Canary, 18.8; sherry, 19.0; Vermouth, 19.0; Cape, 19.2; Malmsey, 19.7; Marsala, 20.2; Madeira, 21.0; port, 23.2; Curaçoa, 27.0; aniseed, 33.0; Maraschino, 34.0; Chartreuse, 43.0; gin, 51.6; brandy, 53.4; rum, 53.7; Irish whisky, 53.9; Scotch, 54.3.

Spirits are said to be "proof" when they contain 57 per cent. The maximum amount of alcohol, says Parkes, that a man can take daily without injury to his health is that contained in 2 oz. brandy, ¼ pt. of sherry, ½ pt. of claret, or 1 pt. of beer.

THE measurement of that part of the skull which holds the brain is stated in cubic inches thus: Anglo-Saxon, 105; German, 105; Negro, 96; Ancient Egyptian, 93; Hottentot, 58; Australian native, 58. In all races the male brain is about ten per cent. heavier than the female. The highest class of apes has only 16 oz. of brain. A man's brain, it is estimated, consists of 300,000,000 nerve cells, of which over 3,000 are disintegrated and destroyed every minute. Every one, therefore, has a new brain once in sixty days. But excessive labor, or the lack of sleep, prevents the repair of the tissues, and the brain gradually wastes away. Diversity of occupation, by calling upon different portions of the mind or body, successfully affords, in some measure, the requisite repose to each. But in this age of overwork there is no safety except in that perfect rest which is the only natural restorative of exhausted power. It has been noticed by observant physicians in their European travels that the German people, who, as a rule, have little ambition and no hope to rise above their inherited station, are peculiarly free from nervous diseases; but in America, where the struggle for advancement is sharp and incessant, and there is nothing that will stop an American but death, the period of life is usually shortened five, ten or twenty years by the effects of nervous exhaustion. After the age of 50 the brain loses an ounce every ten years. Cuvier's weighed 64, Byron's 79, and Cromwell's 90 ounces, but the last was diseased. Post-mortem examinations in France give an average of 55 to 60 ounces for the brains of the worst class of criminals.

In the cholera visitation of 1866, the proportion of deaths per 10,000 inhabitants in the principal cities of Europe was as follows: London, 18; Dublin, 41; Vienna, 51; Marseilles, 64; Paris, 66; Berlin, 83; Naples, 89; St. Petersburg, 98; Madrid, 102; Brussels, 184; Palermo, 197; Constantinople, 738.

There were 48,930 blind people in the United States in 1880, and 33,880 deaf mutes.

It is estimated that the number of insane persons in the United States is 168,900. *Causes of Insanity.*—Hereditary, 24 per cent.; drink, 14 per cent.; business, 12 per cent.; loss of friends, 11 per cent.; sickness, 10 per cent.; various, 29 per cent. This result is the medium average arrived at by Mulhall on comparing the returns for the United States, Engand, France and Denmark.

No fewer than 1,326 editions of the Bible were published in the sixteenth century. In the seventeenth and eighteenth centuries it was translated and published in many languages by the polyglot press of Propaganda Fide at Rome. In the nineteenth century the English and American societies have printed, in the Protestant version, 124,000,000 copies of the Bible or of the New Testament, viz: British, 74,000,000; American, 32,000,000; other societies, 15,000,000 copies.

The King James version of the Bible contains 3,566,480 letters, 773,746 words, 31,173 verses, 1,189 chapters, and 66 books. The word *and* occurs 46,277 times. The word *Lord* occurs 1,855 times. The word *Reverend* occurs but once, which is in the 9th verse of the 111th Psalm. The middle verse is the 8th verse of the 118th Psalm. The 21st verse of the 7th chapter of Ezra contains all the letters of the alphabet except the letter J. The 19th chapter of II Kings and the 37th chapter of Isaiah are alike. The longest verse is the 9th verse of the 8th chapter of Esther. The shortest verse is the 35th verse of the 11th chapter of St. John. There are no words or names of more than six syllables.

Some of Nature's Wonders.

The human body has 240 bones.

The musical scale was invented in 1022.

Man's heart beats 92,160 times in a day.

A salmon has been known to produce 10,000,000 eggs. Some female spiders produce 2,000 eggs. A queen bee produces 100,000 eggs in a season.

There are 9,000 cells in a square foot of honeycomb.

It requires 2,300 silk worms to produce one pound of silk.

It would take 27,600 spiders to produce one pound of web.

LEGAL ADVICE.

BLACKSTONE defines *law* as the rules of human action or conduct, but what is commonly understood by the term is the civil or municipal regulations of a nation as applied to a particular country. The forms of law which govern civil contracts and business intercourse are distinguished as statute and common. Statute law is the written law of the land, as enacted by State or national legislative bodies. The common law is grounded on the general customs of England, and includes the law of nature, the law of God, the principles and maxims of the law and the decisions of the superior courts. It overrides both the canon and the civil law where they go beyond or are inconsistent with it.

To the man involved in litigation the best advice is to go to the best lawyer he can find. But an ounce of prevention is worth a pound of cure, and the purpose of the following pages is to furnish the ounce of prevention. Knowledge is power in nothing so much as in business law, especially since the law presumes that no man is ignorant of the law.

Business Law in Brief.

Ignorance of the law excuses no one.

It is a fraud to conceal a fraud.

The law compels no one to do impossibilities.

An agreement without consideration is void.

Signatures made with a lead pencil are good in law.

A receipt for money paid is not legally conclusive.

The act of one partner binds all the others.

The seal of a party to a written contract imports consideration.

A contract made with a minor cannot be enforced against him. A note made by a minor is voidable.

A contract made with a lunatic is void.

A contract made on a Sunday is void.

Principals are liable for the acts of their agents.

Agents are liable to their principals for errors.

Each individual in a partnership is liable for the whole amount of the debts of the firm.

A note which does not state on its face that it bears interest, will bear interest only after due.

A lease of land for a longer term than one year is void unless in writing.

An indorser of a note is exempt from liability if notice of its dishonor is not mailed or served within twenty-four hours of its non-payment.

In case of the death of the principal maker of a note the holder

is not required to notify a surety that the note is not paid, before the settlement of the maker's estate.

Notes obtained by fraud, or made by an intoxicated person, are not collectible.

If no time of payment is specified in a note it is payable on demand.

An indorser can avoid liability by writing "without recourse" beneath his signature.

A check indorsed by the payee is evidence of payment in the drawer's hands.

An outlawed debt is revived should the debtor make a partial payment.

Want of consideration—a common defense interposed to the payment of negotiable paper—is a good defense between the original parties to the paper; but after it has been transferred before maturity to an innocent holder for value it is not a defense.

Negotiable paper, payable to bearer or indorsed in blank, which has been stolen or lost, cannot be collected by the thief or finder, but a holder who receives it in good faith before maturity, for value, can hold it against the owner's claims at the time it was lost.

Sometimes the holder of paper has the right to demand payment before maturity; for instance, when a draft has been protested for non-acceptance and the proper notices served, the holder may at once proceed against the drawer and indorsers.

If a note or draft is to be paid in the State where it is made, the contract will be governed by the laws of that State. When negotiable paper is payable in a State other than that in which it is made, the laws of that State will govern it. Marriage contracts, if valid where they are made, are valid everywhere. Contracts relating to personal property are governed by the laws of the place where made, except those relating to real estate, which are governed by the laws of the place where the land is situated.

If negotiable paper, pledged to a bank as security for the payment of a loan or debt, falls due, and the bank fails to demand payment and have it protested when dishonored, the bank is liable to the owner for the full amount of the paper.

Agreements and Contracts.

A contract or agreement is where a promise is made on one side and assented to on the other, or where two or more persons enter into engagement with each other by a promise on either side. In a written contract assent is proved by the signature or mark. In verbal agreements it may be given by a word

or a nod, by shaking of hands, or by a sign. The old saw, "Silence gives consent," is often upheld in law.

The conditions of a contract, as applying to individuals, are: 1. Age; 2. Rationality; and 3, as to Corporations, the possession of general or special statutory powers.

Persons under age are incompetent to make contracts, except under certain limitations. Generally such persons are incapable of making binding contracts.

As to rationality, the general principle of law is that all persons not rendered incompetent by personal disability, or by considerations of public policy, are capable of making a contract.

Corporations have powers to make contracts strictly within the limits prescribed by their charters, or by special or general statute.

The first step toward a contract is the proposition or offer, which may be withdrawn at any time before it is agreed to. When the proposition is verbal, and no time is specified, it is not binding unless accepted at once. To give one the option or refusal of property at a specified price, is simply to give him a certain time to make up his mind whether he will buy the property or not. To make the option binding he must accept within the time named. The party giving the option has the right to withdraw it, and sell the property to another, at any time previous to its acceptance, if the offer is gratuitous, and there is no consideration to support it.

If a letter of acceptance is mailed, and immediately after a letter withdrawing the offer is received, the contract is binding. An acceptance takes effect from the time it is mailed, not from the time it is received; it must, however, be in accordance with the original proposition, for any new matter introduced would constitute a new offer. When the offer is accepted, either verbally or in writing, it is an express assent, and is binding.

A contract made under a mistake of law is not void. Everybody is presumed to know the law. This, however, applies only to contracts permitted by law and clear of fraud.

A refusal of an offer cannot be retracted without the consent of the second party. Once a proposition is refused, the matter is ended. And no one has the right to accept an offer except the person to whom it was made.

The consideration is the reason or thing for which the parties bind themselves in the contract, and it is either a benefit to the promisor or an injury to the other party. Considerations are technically divided into *valuable* and *good*, and it sometimes happens that the consideration need not be expressed, but is implied. A valuable consideration is either money or property or service to be given, or some injury to be endured. A promise to marry is considered a valuable consideration. A good con-

sideration means that the contract is entered into because of consanguinity or affection, which will support the contract when executed, but will not support an action to enforce an executory contract. Whether a consideration is sufficient or not is tested by its being a benefit to the promisor or an injury to the other party. If it has a legal value, it makes no difference how small that value may be. The promisor need not always be benefited, as, for instance, the indorser of a note, who is liable although he gets no benefit. But if a person promise to do something himself for which no consideration is to be received, there is no cause of action for breach of the contract.

There are several causes which void contracts, first among which is fraud. Fraud is defined to be "every kind of artifice employed by one person for the purpose of willfully deceiving another to his injury." No fraudulent contract will stand in law or in equity. The party upon whom the fraud has been practiced must void the contract as soon as he discovers the fraud, for if he goes on after having knowledge of the fraud he cannot afterwards avoid it. But the one who perpetrates the fraud cannot plead that ground for voiding it. Contracts in restraint of trade are void, as also are contracts in opposition to public policy, impeding the course of justice, in restraint of marriage contrary to the insolvent acts, or for immoral purposes. Any violation of the essential requisites of a contract, or the omission of an essential requisite, will void it.

DON'T enter into an agreement on a Sunday unless it is ratified on a week day.

DON'T make a contract with a person of unsound mind or under the influence of liquor, or otherwise under restraint of liberty, mind or body. Use caution in making contracts with an illiterate, blind or deaf and dumb person, and see to it that witnesses are present.

DON'T put a forced construction on a contract—the intent of the parties is a contract.

DON'T suppose that you can withdraw a proposition made in writing and sent by mail after the party to whom it was made has mailed an unconditional acceptance.

DON'T suppose that a conditional acceptance of a proposition is binding on the party making the proposition.

DON'T forget that the courts will construe a contract according to the law prevailing where it was made.

DON'T forget that the law says, "no consideration, no contract," and that the courts will not enforce a contract which is too severe in its provisions.

DON'T sign an agreement unless you have carefully weighed its provisions, which should all be fixed and certain.

Notes and Negotiable Paper.

The superstructure of business as it exists to-day rests on the broad foundation of confidence—the result of what may be called the evolution of commerce, and the principal stages in this evolution are an interesting study. First there was only barter in kind, as still practiced among savages—for example, the exchange of a bushel of corn for a handful of arrow-heads. Then came the introduction of money as a medium of exchange; and to-day we have the substitution of negotiable paper as documentary evidence of indebtedness, including promissory notes, due bills, drafts, checks, certificates of deposit, bills of exchange, bank bills, treasury notes (greenbacks), and all other evidences of debt, the ownership of which may be transferred from one person to another.

The mere acknowledgment of debt is not sufficient to make negotiable paper; the *promise* of payment or an *order* on some one to pay is indispensable. This promise must be for money only. The amount must be exactly specified. The title must be transferable. This feature must be visible on the face of the paper by the use of such words as "bearer" or "order." In some of the States peculiar phrases are ordered by statute, as "Payable without defalcation or discount," or "Payable at ——," naming the bank or office.

A written agreement, signed by one person, to pay another, at a fixed time, a stated sum of money, is a *promissory note.* It becomes negotiable by being made payable to an order on some one or to bearer. As it is a contract, a consideration is one of its essential elements. Yet, although it be void as between the two first parties, being negotiable and coming into the hands of another person who gives value for it, not knowing of its defect, it has full force and may be collected.

The date is of great consequence. In computing time, the day of date is not counted, but it is the fixed point beginning the time at the end of which payment must be made. Omission of the date does not destroy a note, but the holder must prove to the time of its making. The promise to pay must be precise as to time which the note is to run. It must be at a fixed period, or conditional upon the occurrence of something certain to happen, as "at sight," "five days after sight," "on demand," "three months after date," "ten days after the death of John Doe." The time not being specified, the note is considered "payable on demand."

The maker, the person who promises and whose signature the note bears, must be competent. Insane people and idiots are *naturally*, and aliens, minors and married women may be *legally*, incompetent. The maker is responsible and binds himself to pay the amount stated on the note at its maturity. He need not

pay it before it becomes due, but should he do so and neglect to cancel the note, he would be again responsible if any other person, without knowledge of such payment, acquired it for value before maturity. Even a receipt for payment from the first payee would not stand good against the subsequent holder.

The payee is the person in whose favor the note is drawn—the legal holder, the person to whom the money must be paid. When a note is made payable simply to bearer, without naming the payee, any one holding the note honestly may collect.

A subsequent party, one who comes into possession of the note after the original holder, has a better claim than the first one, for the reason that between the maker and the first payee there may have been, in the contract, some understanding or condition militating against the payment when it would become due, but the third person, knowing nothing of this, gives his value and receives the note. The law will always sustain the subsequent party.

The indorser is held responsible if the maker fails to pay when the note arrives at maturity. A note payable to order must be indorsed by a holder upon passing it to another, and, as value has been given each time, the last holder will look to his next preceding one and to all the others.

A note, being on deposit as collateral security, becoming due, the temporary holder is the payee and must collect.

An indorsement is a writing across the back of the note, which makes the writer responsible for the amount of the note. There are various forms of indorsement.

1. *In blank*, the indorser simply writing his name on the back of the note.

2. *General*, or *in full*, the indorser writing above his signature "Pay —— ——" or "Pay —— —— or order."

3. *Qualified*, the words "without recourse" being used after the name of the payee in the indorsement.

4. *Conditional*, a condition being stated, as: "Pay —— ——, unless payment forbidden before maturity."

5. *Restrictive*, as: "Pay —— —— only."

The blank indorsement, the full indorsement and the general indorsement are practically the same; each entitles the holder of the note to the money, and to look to the indorser for payment if the maker of the note defaults. It has even been held that in a general indorsement the holder had the right to fill in the words "or order" if he saw fit. The qualified indorsement releases the indorser from any liability in case the maker of the note defaults. The conditional and restrictive indorsement are used only in special cases. Each indorser is severally and collectively liable for the whole amount of the note indorsed if it is

dishonored, provided it is duly protested and notice given to each. The indorser looks to the man who indorsed it before him, and so back to the original maker of the note. As soon as a note is protested, it is vitally necessary that notice should be sent to each person interested at once.

TO BE ON THE SAFE SIDE, it is well to see to it that any note offered for negotiation—

Is dated correctly;

Specifies the amount of money to be paid;

Names the person to whom it is to be paid;

Includes the words "or order" after the name of the payee, if it is desired to make the note negotiable;

Appoints a place where the payment is to be made;

States that the note is made "for value received;"

And is signed by the maker or his duly authorized representative.

In some States phrases are required in the body of the note, such as, "without defalcation or discount;" but, as a general thing, that fact is understood without the statement.

Partnership.

The general rule is that every person of sound mind, and not otherwise restrained by law, may enter into a contract of partnership.

There are several kinds of partners:

1. *Ostensible* partners, or those whose names are made public as partners, and who in reality are such, and who take all the benefits and risks.

2. *Nominal* partners, or those who appear before the public as partners, but who have no real interest in the business.

3. *Dormant*, or *silent* partners, or those whose names are not known or do not appear as partners, but who, nevertheless, have an interest in the business.

4. *Special*, or *limited* partners, or those who are interested in the business only to the amount of the capital they have invested in it.

5. *General* partners, who manage the business, while the capital, either in whole or in part, is supplied by a special partner or partners. They are liable for all the debts and contracts of the firm.

A nominal partner renders himself liable for all the debts and contracts of the firm.

A dormant partner, if it becomes known that he has an interest, whether creditors trusted the firm on his account or not, becomes liable equally with the other partners.

The regulations concerning special or limited partnerships, in

any particular State where recognized, are to be found in the statutes of such State ; and strict compliance with the statutes is necessary in order to avoid incurring the responsibilities attaching to the position of general partner.

A person who lends his name as a partner, or who suffers his name to continue in the firm after he has actually ceased to be a partner thereof, is still responsible to third persons as a partner.

A partner may buy and sell partnership effects ; make contracts in reference to the business of the firm ; pay and receive money ; draw, and indorse, and accept bills and notes ; and all acts of such a nature, even though they be upon his own private account, will bind the other partners, if connected with matters apparently having reference to the business of the firm, and transacted with other parties ignorant of the fact that such dealings are for the particular partner's private account. The representation or misrepresentation of any fact made in any partnership transaction by one partner, or the commission of any fraud in such transaction, will bind the entire firm, even though the other partners may have no connection with, or knowledge of the same.

If a partner sign his individual name to negotiable paper, all the partners are bound thereby, if such paper appear on its face to be on partnership account. If negotiable paper of a firm be given by one partner on his private account, and in the course of its circulation pass into the hands of a *bona fide* holder for value, without notice or knowledge of the fact attending its creation, the partnership is bound thereby.

One partner cannot bind the firm by deed, though he may by deed execute an ordinary release of a debt due the partnership.

If no time be fixed in articles of copartnership for the commencement thereof, it is presumed to commence from the date and execution of the articles. If no precise period is mentioned for continuance, a partner may withdraw at any time, and dissolve such partnership at his pleasure ; and even if a definite period be agreed upon, a partner may, by giving notice, dissolve the partnership as to all capacity of the firm to bind him by contracts thereafter made. The withdrawing partner subjects himself, however, to a claim for damages by reason of his breach of the covenant.

The death of a partner dissolves the partnership, unless there be an express stipulation that, in such an event, the representatives of the deceased partner may continue the business in connection with the survivors, for the benefit of the widow and children.

A partnership is dissolved by operation of law ; by a voluntary and *bona fide* assignment by any partner of his interest therein ;

by the bankruptcy or death of any of the partners; or by a war between the countries of which the partners are subjects.

Immediately after a dissolution, notice of the same should be published in the papers, and a special notice sent to every person who has had dealings with the firm. If these precautions be not taken, each partner will still continue liable for the acts of the others to all persons who have had no notice of such dissolution.

DON'T enter into a partnership without carefully drawn articles, and don't sign the articles until the partnership funds are on deposit.

DON'T forget that a partner may be called upon to make good partnership losses with his individual property, and that each partner may be held for the acts of the other partners as well as for his own.

DON'T enter a firm already established unless you are willing to become responsible for its debts.

DON'T do anything out of the usual run of business without the consent of your partners.

DON'T mix private matters with partnership affairs, and don't continue in a partnership where trust and confidence are lacking.

DON'T continue a partnership after expiration of articles, and do not make any change without due public notice.

DON'T dissolve a partnership without due public notice or without designating a member to settle all matters outstanding.

Agency and Attorney.

By agency is meant the substitution of one person by and for another, the former to transact business for the latter. An agency may be established by *implication*—an express agreement with a person that he is to become the agent of another not being necessary—or *verbally*, or by *writing*. A verbal creation of agency suffices to authorize the agent to make a contract even in cases where such contract must be in writing.

Agency is of three kinds: special, general and professional. A special agency is an authority exercised for a special purpose. If a special agent exceed the limits of his authority, his principal is not bound by his acts.

A general agency authorizes the transaction of all business of a particular kind, or growing out of a particular employment. The principal will be bound by the acts of a general agent, though the latter act contrary to *private* instructions, provided he keep, at the same time, within the general limits of his authority.

Professional agents are those licensed by the proper authority to transact certain kinds of business for a compensation. The

following are among this class of agents: 1. Attorneys. 2. Brokers. 3. Factors. 4. Auctioneers. 5. Masters of Ships.

In regard to the subject of an agency, the general rule is, that whatever a man may do in his own right he may also transact through another. Things of a personal nature, implying personal confidence on the part of the person possessing them, cannot be delegated.

Infants, married women, lunatics, idiots, aliens, belligerents, and persons incapable of making legal contracts, cannot act as principals in the appointment of agents. Infants and married women may, however, become principals in certain cases.

Agency may be terminated in two ways: (1) by the act of the principal or agent; (2) by operation of law. In the latter case, the termination of the agency is effected by lapse of time, by completion of the subject-matter of the agency, by the extinction of the subject-matter, or by the insanity, bankruptcy or death of either party.

DON'T do through another what would be illegal for you to do yourself.

DON'T lose any time in repudiating illegal acts of your agent.

DON'T make an illegal act of your agent's your own by accepting the benefit thereof.

DON'T transact business through an agent unless he can show that he stands in his principal's stead in the matter in hand.

DON'T, as agent, appoint sub-agents without the consent of your principal.

DON'T go beyond your authority in an agency unless you are willing to become personally responsible.

DON'T accept an agency, or act as an attorney in fact, in complicated matters unless your powers are clearly defined in writing.

Landlord and Tenant.

Leases for one year or less need no written agreement. Leases for more than a year must be in writing; if for life, signed, sealed, and witnessed in the same manner as any other important document.

Leases for over three years must be recorded. No particular form is necessary.

If no agreement in writing for more than a year can be produced, the tenant holds the property from year to year at the will of the landlord. If there is no agreement as to time, the tenant as a rule holds from year to year.

A tenancy at will may be terminated by giving the tenant one month's notice in writing, requiring him to remove from the premises occupied.

A tenant is not responsible for taxes, unless it is so stated in the lease.

The tenant may underlet as much of the property as he desires, unless it is expressly forbidden in the lease. Tenants at will cannot underlet.

A married woman cannot lease her property under the common law, but this prohibition is removed by statute in most of the States. A husband cannot make a lease which will bind his wife's property after his death.

A lease made by a minor is not binding after the minor has attained his majority. It binds the lessee, however, unless the minor should release him. Should the minor receive rent after attaining his majority, the lease will be thereby ratified. A lease given by a guardian will not extend beyond the majority of the ward.

A new lease renders void a former lease.

In case there are no writings, the tenancy begins from the day possession is taken; where there are writings and the time of commencement is not stated, the tenancy will be held to commence from the date of said writings.

Leases on mortgaged property, whereon the mortgage was given prior to the lease, terminate when the mortgage is foreclosed.

Where a tenant assigns his lease, even with the landlord's consent, he will remain liable for the rent unless his lease is surrendered or cancelled.

There are many special features of the law of landlord and tenant in relation to agricultural tenancy. Generally an outgoing tenant cannot sell or take away the manure. A tenant whose estate has terminated by an uncertain event which he could neither foresee nor control is entitled to the annual crop which he sowed while his estate continued, by the law of emblements. He may also, in certain cases, take the emblements or annual profits of the land after his tenancy has ended, and, unless restricted by some stipulation to the contrary, may remove such fixtures as he has erected during his occupation for convenience, profit or comfort; for, in general, what a tenant has added he may remove, if he can do so without injury to the premises, unless he has actually built it in so as to make it an integral part of what was there originally.

The following are immovable fixtures: Agricultural erections, fold-yard walls, cart house, barns fixed in the ground, beast house, carpenter shop, fuel house, pigeon house, pineries substantially fixed, wagon house, box borders not belonging to a gardener by trade, flowers, trees, hedges, ale-house bar, dressers, partitions, locks and keys, benches affixed to the house,

statue erected as an ornament to grounds, sun dial, chimney piece not ornamental, closets affixed to the house, conduits, conservatory, substantially affixed, doors, fruit trees if a tenant be not a nurseryman by trade, glass windows, hearths, millstones, looms substantially affixed to the floor of a factory, threshing machines fixed by bolts and screws to posts let into the ground.

DON'T occupy premises until a written lease is in your possession, and don't depend on promises of a landlord unless they are part of such lease.

DON'T accept a married woman as tenant unless the law of the State permit her to make an executory contract.

DON'T think that you can legally eject sub-tenants unless you have given them notice of the tenant's forfeiture of his lease.

DON'T make such improvements in premises occupied by you as the law would regard as immovable fixtures, unless you are willing to turn them over to the landlord when your lease expires. A building erected on foundations sunk into the ground would become part of the realty and thus belong to the landlord.

DON'T think, however, that you have no right to remove trade fixtures erected by you.

DON'T accept less than thirty days' notice when you rent by the month.

DON'T forget that where premises are let for illegal use the law will not aid you in collecting arrears for rent.

Law Relating to Farms, Etc.

In a deed to agricultural property the boundaries should be clearly determined. The question, What does the farmer get? is answered by these boundaries, and the deed to a farm always includes the dwelling houses, barns and other improvements thereon belonging to the grantor, even though these are not mentioned. It also conveys all the fences standing on the farm, but all might not think it also included the fencing-stuff, posts, rails, etc., which had once been used in the fence, but had been taken down and piled up for future use again in the same place. But new fencing material, just bought, and never attached to the soil, would not pass. So piles of hop poles, stored away, if once used on the land, and intended to be again so used, have been considered a part of it, but loose boards or scaffold poles, merely laid across the beams of a barn and never fastened to it, would not be, and the seller of the farm might take them away. Standing trees, of course, also pass, as part of the land; so do trees blown down or cut down, and still left in the woods where they fell, but not if cut and corded up for sale; the wood has then become personal property.

If there be any manure in the barnyard or in the compost heap on the field, ready for immediate use the buyer ordinarily, in the absence of any contrary agreement, takes that also as belonging to the farm, though it might not be so if the owner had previously sold it to some other party, and had collected it together in a heap by itself, for such an act might be a technical severance from the soil, and so convert real into personal estate; and even a lessee of a farm could take away the manure made on the place while he was in occupation. Growing crops also pass by the deed of a farm unless they are expressly reserved, and when it is not intended to convey those it should be so stated in the deed itself; a mere oral agreement to that effect would not be, in most States, valid in law. Another mode is to stipulate that possession is not to be given until some future day, in which case the crops or manures may be removed before that time.

An adjoining road is, to its middle, owned by the farmer whose land is bound, unless there are reservations to the contrary in the deeds through which he derives title. But this ownership is subject to the right of the public to the use of the road.

If a tree grows so as to come over the land of a neighbor, the latter may cut away the parts which so come over, for he owns his land and all that is above or below it. If it be a fruit tree he may cut every branch or twig which comes over his land, but he cannot touch the fruit which falls to the land. The owner of the tree may enter peaceably upon the land of the neighbor and take up the branches and fruit.

Lien Laws.

Any one who, as contractor, sub-contractor or laborer, performs any work, or furnishes any materials, in pursuance of, or in conformity with, any agreement or contract with the owner, lessee, agent or one in possession of the property, toward the erection, altering, improving or repairing of any building, shall have a lien for the value of such labor or materials on the building or land on which it stands to the extent of the right, title and interest of the owner, lessee or person in possession at the time of the claimant's filing his notice with the clerk of the county court. Such lien is called a mechanic's lien.

The notice should be filed within thirty days after completion of the work or the furnishing of the materials, and should state the residence of the claimant, the amount claimed, from whom due, when due, and to whom due, the name of the person against whom claimed, the name of the owner, lessee or person in possession of the premises, with a brief description of the latter.

Liens cease in one year after the filing of the notice, unless an action is begun, or the lien is continued by an order of court.

The following classes of persons are generally entitled to lien: 1. Bailees, who may perform labor and services, on the thing bailed, at the request of the bailor. 2. Innkeepers, upon the baggage of guests they have accommodated. 3. Common carriers, upon goods carried, for the amount of their freight and disbursements. 4. Vendors, on the goods sold for payment of the price where no credit has been expressly promised or implied. 5. Agents, upon goods of their principals, for advancements for the benefit of the latter. 6. All persons are entitled to the right of lien who are compelled by law to receive property and bestow labor or expense on the same.

The right of lien may be waived: 1. By express contract. 2. By neglect. 3. By new agreement. 4. By allowing change of possession. 5. By surrendering possession.

The manner of the enforcement of a lien, whether it be an innkeeper's, agent's, carrier's, factor's, etc., depends wholly upon the nature and character of the lien.

DON'T purchase real estate unless the records have been thoroughly searched for all liens known to the law, or until all notices of action against the same have been discharged.

DON'T think that you have no right to sell perishable property on which you have a lien. Your lien will attach to the proceeds.

DON'T foreclose a lien without proper notice.

DON'T make payments to a contractor before you have full knowledge of all liens filed.

DON'T forget that liens take precedence according to priority, and that interest always runs on a judgment.

Deeds—Transfer of Property.

A deed is a writing by which lands, tenements or hereditaments are conveyed, sealed and delivered. It must be written or printed on parchment or paper; the parties must be competent to contract; there must be a proper object to grant; a sufficient consideration; an agreement properly declared; if desired, it must have been read to the party executing it; it must be signed and sealed; attested by witnesses, in the absence of any statute regulation to the contrary; properly acknowledged before a competent officer; and recorded within the time and in the office prescribed by the State wherein executed.

The maker of a deed is the *grantor;* the party to whom it is delivered, the *grantee.* If the grantor have a wife, she must, in the absence of a statute to the contrary, sign and acknowledge the deed; otherwise, after the husband's death, she may claim the use of one-third, during her life.

By a *general warranty* deed the grantor covenants to insure the lands against all persons whatsoever; by a *special warranty* deed he warrants only against himself and those claiming under him. In deeds made by executors, administrators or guardians there is generally no warranty. *A quit-claim deed* releases all the interest which the grantor has in the land, whatever it may be.

A *deed of trust* is given to a person called a trustee, to hold in fee simple, or otherwise, for the use of some other person who is entitled to the proceeds, profits or use.

A deed may be made void by alterations made in it after its execution; by the disagreement of the parties whose concurrence is necessary; or by the judgment of a competent tribunal.

Interlineations or erasures in a deed, made before signing, should be mentioned in a note, and witnessed in proper form. After the acknowledgment of a deed the parties have no right to make the slightest alteration. An alteration of a deed after execution, if made in favor of the grantee, vitiates the deed. If altered before delivery, such alteration destroys the deed as to the party altering it.

Abstracts of title are brief accounts of all the deeds upon which titles rest, and judgments and instruments affecting such titles.

The evidences of title are usually conveyances, wills, orders or decrees of courts, judgments, judicial sales, sales by officers appointed by law, acts of the Legislature and of Congress.

DON'T accept a deed unless all the following conditions are complied with: 1. It must be signed, sealed and witnessed. 2. Interlineations must be mentioned in the certificate of acknowledgment. 3. All the partners must join in a deed from a partnership. 4. A deed from a corporation should bear the corporate seal and be signed by officers designated in the resolution of the directors authorizing it. 5. A deed from a married woman should be joined in by the husband. 6. A deed from an executor should recite his power of sale. 7. The consideration must be expressed.

DON'T deed property to your wife direct. A deed to your wife does not cut off obligations contracted previously.

DON'T pay consideration money on a conveyance of real estate until the record has been searched to the moment of passing title, and unless you know of your own knowledge that no judgments, mortgages or tax liens are outstanding against the property.

DON'T delay in having a deed or mortgage recorded.

DON'T attempt to give a better title than you have yourself.

Mortgages.

A mortgage is a conveyance of property, either real or personal, to secure payment of a debt. When the debt is paid the mortgage becomes void and of no value. In real estate mortgages the person giving the mortgage retains possession of the property, receives all the debts and other profits, and pays all taxes and other expenses. The instrument must be acknowledged, like a deed, before a proper public officer, and recorded in the office of the county clerk or recorder, or whatever officer's duty it is to record such instruments. All mortgages must contain a redemption clause and must be signed and sealed. The time when the debt becomes due, to secure which the mortgage is given, must be plainly set forth and the property conveyed must be clearly described, located and scheduled.

Some mortgages contain a clause permitting the sale of the property without decree of court when a default is made in the payment either of the principal sum or the interest.

A foreclosure is a statement that the property is forfeited and must be sold.

When a mortgage is assigned to another person, it must be for a valuable consideration; and the note or notes which it was given to secure must be given at the same time.

If the mortgaged property, when foreclosed and brought to sale, brings more money than is needed to satisfy the debt, interest and costs, the surplus must be paid to the mortgagor.

Satisfaction of mortgages upon real or personal property may be either—

1. By an entry upon the margin of the record thereof, signed by the mortgagee or his attorney, assignee or personal representative, acknowledging the satisfaction of the mortgage, in the presence of the recording officer; *or*—

2. By a receipt indorsed upon the mortgage, signed by the mortgagee, his agent or attorney, which receipt may be entered upon the margin of the record; *or*—

3. It may be discharged upon the record thereof whenever there is presented to the proper officer an instrument acknowledging the satisfaction of such mortgage, executed by the mortgagee, his duly authorized attorney in fact, assignee or personal representative, and acknowledged in the same manner as other instruments affecting real estate.

Chattel mortgages are mortgages on personal property. Most of the rules applicable to mortgages on real estate apply also to those on personal property, though in some States there are laws regulating personal mortgages. Any instrument will answer the purpose of a chattel mortgage which would answer as a bill of sale, with a clause attached providing for the avoidance of the mortgage when the debt is paid.

A chattel mortgage will not cover property subsequently ac-

quired by the mortgagor. Mortgages of personal property should contain a clause providing for the equity of redemption. A mortgagee may sell or transfer his mortgage to another party for a consideration, but such property cannot be seized or sold until the expiration of the period for which the mortgage was given. Mortgages given with intent to defraud creditors are void.

DON'T lose any time in having a mortgage properly recorded.

DON'T pay installments on chattel mortgages unless the same are indorsed thereon.

DON'T lose sight of the fact that a chattel mortgage is a conditional bill of sale.

DON'T accept a chattel mortgage the term whereof is for more than a year.

DON'T neglect to have a chattel mortgage signed, sealed and witnessed, and don't fail to see to it that the schedule contains every article embraced under it.

DON'T fail to see to it that goods or chattels mortgaged to you are properly insured.

DON'T suppose that a chattel mortgage is valid when the debt to be secured by it is not.

DON'T give a chattel mortgage payable on demand unless you are prepared to forfeit the chattels at any moment.

DON'T think that destruction by fire or otherwise of the chattels mortgaged wipes out the debt.

DON'T forget that foreclosure in the case of a chattel mortgage is unnecessary except to cut off claims of other creditors.

Assignments.

An assignment is a transfer of property made in writing. In effect it is passing to another person all of one's title or interest in any sort of real or personal property, rights, actions or estates. However, some things are not assignable; an officer's pay or commission, a judge's salary, fishing claims, Government bounties, or claims arising out of frauds or torts. Personal trusts cannot be assigned, as a guardianship or the right of a master in his apprentice.

Unlike many other legal devices the holder of an assignment is not bound to show that a valuable consideration was given. The owner of a cause of action may give it away if he pleases, and in the positive absence of evidence to the contrary the court will presume that the assignment was for a sufficient consideration.

Proof will be called for only when it appears that the assignment was a mere sham or fraudulent. No formality is required

by law in an assignment. Any instrument between the contracting parties which goes to show their intention to pass the property from one to another will be sufficient. It may be proved, for instance, by the payee of a note, that he indorsed (or delivered without indorsement) the note to the assignee, and this is sufficient evidence of assignment.

In every assignment of an instrument, even not negotiable, the assignee impliedly warrants the validity of the instrument and the obligation of the third party to pay it. He warrants that there is no legal defense against its collection arising out of his connection with the parties; that all parties were legally able to contract, and that the amount is unpaid.

An assignment carries with it all the collateral securities and guaranties of the original debt, even though they are not mentioned in the instrument.

Where property is assigned for the benefit of creditors, its actual transfer to the assignee must be made immediately. When an assignment is made under the common law, the assignor may prefer certain creditors; but in a State where this sort of an assignment is governed by statute, no preference can be shown. An assignment for the benefit of creditors covers all of the assignor's property, wherever or whatever it may be, that is not exempt from execution.

When insured property is sold the insurance policy should be assigned. This can only be done with the consent of the insurer, and that consent must be at once obtained.

Correct schedules of the property assigned should accompany and be attached to every assignment.

Inns, Hotels and Boarding-houses.

An inn, or hotel, is a place of entertainment for travelers. If an innkeeper opens his house for travelers, it is an implied engagement to entertain all persons who travel that way, and upon this universal assumption an action will lie against him for damages if he, without good reason, refuses to admit a traveler.

Innkeepers are responsible for the safe custody of the goods of their guests, and can limit their liability only by an express agreement or special contract with their guests; but if goods are lost through negligence of the owner himself the innkeeper's liability ceases. An innkeeper may retain the goods of his guest until the amount of the guest's bill has been paid.

A boarding-house is not an inn, nor is a coffee-house or eating-room. A boarding-house keeper has no lien on the goods of a boarder except by special agreement, nor is he responsible for their safe custody. He is liable, however, for loss caused by the

negligence of his servants. An innkeeper is liable for loss without such negligence.

Bonds.

A written instrument, admitting an obligation on the part of the maker to pay a certain sum of money to another specified person at a fixed time, for a valuable consideration, is called a bond. The obligor is the one giving the bond; the beneficiary is called the obligee. This definition applies to all bonds, but generally these instruments are given to guarantee the performance or non-performance of certain acts by the obligor, which being done or left undone, as the case may be, the bond becomes void, but if the conditions are broken it remains in full force. As a rule, the bond is made out for a sum twice the amount of any debt which is apt to be incurred by the obligor under its conditions, the statement being set forth that the sum named is the penalty, as liquidated or settled damages, in the event of the failure of the obligor to carry out the conditions.

An act of Providence, whereby the accomplishment of a bond is rendered impossible, relieves the obligor of all liability.

A bond for the payment of money differs from a promissory note only in having a seal.

Bills of Sale.

A bill of sale is a formal written conveyance of personal property. If the property is delivered when sold, or if part of the purchase money is paid, a written instrument is not necessary to make the conveyance, but it is convenient evidence of the transfer of title. But, to protect the interests of the purchaser against the creditors of the seller, the bill is not sufficient of itself; there should also be a delivery of the property. If an actual and continued change of possession does not accompany the sale it is void as against the creditors of the seller and subsequent purchasers and mortgagees in good faith, unless the buyer can show that his purchase was made in good faith, without intent to defraud, and that there was some good reason for leaving the property in the hands of the seller.

Guaranty

Is an assurance made by a second party that his principal will perform some specific act. For instance, A gives B a note, and C by indorsing the instrument guarantees to B that A will pay it at maturity. C is the guarantor. His liability is special, and if B renews the note when it becomes due he is no longer liable. A guaranty for collection is a very different thing from a guaranty of payment. The first warrants that the money is collect-

ible; the latter, that it will be paid at maturity. In the first case the party guaranteed must be able to prove that due diligence was employed in attempting to collect the money; in the second, no such proof is necessary. The only form necessary in guaranteeing a note is writing one's name across the back of it,—a process commonly called indorsing.

Corporations.

Several persons joining together for the accomplishment of any business or social purpose can legally organize themselves into a corporation, a form of partnership which combines the resources of all, and yet gives a limited pecuniary liability, amounting only to the amount of stock owned by each stockholder. In the States, the legislature of each Commonwealth enjoys the power of regulating the corporations, and in the Territories this power is, of course, vested in the General Government. The actual cost of organization amounts to something less than $10, most of which is in fees to the Secretary of State. When the stock has been subscribed a meeting is called, and each shareholder casts a vote for every share which he owns or holds a proxy for, for each person who is to be elected director, or he may give one director as many votes as the number of shares he is voting, multiplied by the number of directors to be elected, amounts to, or distribute his votes as he chooses. Thus, if he owns ten shares of stock and there are six directors to be elected, he has sixty votes, which he can give, either ten for each director, or twenty for each of three, or sixty for one, or in any other way that he sees fit, so that his whole vote will not be more than sixty votes. These directors meet as soon after the election as possible and choose a president, vice-president, secretary and treasurer, whereupon the corporation is ready for business.

The law in all the States on the subject of incorporating companies is very similar, and the necessary forms are to be obtained usually from the Secretary of State.

Wills and How to Make Them.

Every description of property, whether real or personal, may be given by will. In the case of persons dying owing debts, however, the law gives to the executors sufficient of the personal property of the deceased to pay off all existing indebtedness, irrespective of the terms of the will; and where the personal property is not sufficient for this purpose, real property may be so appropriated.

Property may be bequeathed by will to all persons, including married women, infants, lunatics, idiots, etc.

Wills may be made by any person not disqualified by age or

mental incapacity. Generally speaking, a person must have attained the age of twenty-one years before he or she can make a valid will of lands, and the same age, in many States, is required for a will of solely personal property.

In New York males of eighteen and females of sixteen are competent to bequeath personal property. "Sound and disposing mind and memory" are always essential to the validity of any will. For this reason, idiots, lunatics, intoxicated persons (during intoxication), and persons of unsound or weak minds, are incompetent to make wills. A will procured by fraud is also invalid, although the testator be fully competent to make a valid will. All wills must be in writing, except those made by soldiers in active service during war, and by sailors while at sea. Such persons may make a verbal or *nuncupative* will, under certain restrictions, as to witnesses, etc. No particular form of words is required.

A valid will must be subscribed or signed by the testator, or some one for him, in his presence, and at his request. The signature must be affixed in the presence of each of the witnesses. In case the will be signed by some one for him, the testator must *acknowledge* the signature to be his own in presence of the witnesses. The testator must declare to each of the subscribing witnesses that the instrument is his "last will and testament." This is of the utmost importance, and is called the "publication." There must be at least two (three are required in some of the States) subscribing witnesses, who must act as such at the testator's request, or at the request of some one in his presence. The subscribing witnesses must not be beneficially interested in the provisions of the will. These witnesses must all sign the will in the presence of the testator, and (in New York and some of the other States) in the presence of each other.

A codicil is an appendix annexed to the will after its execution, whereby the testator makes some change in, or addition to, his former disposition, and must be signed, published and attested in the same manner as the original will.

The revocation of a will may be express or implied. Express, by the execution of a new and later will, or by the intentional destruction of the old one, or by a formal written revocation, signed and witnessed in the same manner as the will itself. An implied revocation is wrought by the subsequent marriage of the testator and the birth of children, or by either.

DON'T leave anything uncertain in a will, and don't neglect to declare it to be your last will and testament.

DON'T make a will without two (better three) witnesses, none of whom must be interested in it. See that each witness writes his full name and address.

DON'T make a new will unless you destroy or revoke the old one, and don't add a codicil unless it is executed in the same way as the original will.

DON'T neglect to make a new will if you mortgage or sell property devised or bequeathed in a prior one.

DON'T make a will which does not provide for children that may be born.

DON'T will property to a corporation whose charter does not permit it to take by devise or bequest.

DON'T fail to say "bequeath" for personal and "devise" for real property.

Heirship to Property Not Bequeathed.

In England, where the policy is to keep landed estates undivided, the law of primogeniture prevails, giving to the eldest son and his descendants superior rights to the property. In case of default, the second son and his descendants become the heirs, and so on. If there be only daughters, they inherit equally.

In the United States the property would be divided among the heirs as follows: (1.) To the children. These, if of equal degree, receive the property in equal shares. If of unequal degree, the more remote descendants take the share that would have belonged to their parent, if living. Thus: A, B and C are children of the testator, and of these B and C are living and A is dead, at the testator's death. The estate, after paying all debts, will be divided into three equal parts, the descendants of A, together, receiving one-third, and B and C each another third; but in case A left no descendants, then B and C each will be awarded one half of the property. (2.) If there are no descendants the parents of the testator would receive the estate, the father being sometimes preferred to the mother. (3.) If parents are not living, the brothers and sisters of the testator would take the property, sharing equally. If one or more of the brothers or sisters had died, their children would receive the share that would have descended to their parent. (4.) Grandparents would be the next claimants, after which (5.) uncles and aunts, and after them (6.) their children, and so on. In case no heirs are found, the property inures to the State.

The above principles are stated as generally recognized in the laws of the several States. As these laws, however, vary, full information can only be obtained from the statutes of the several States.

Legacies and the Duties of Executors and Administrators.

A legacy is a gift or bequest of personal property by will or testament. Legacies are of three kinds: General, specific and demonstrative.

A general legacy does not amount to a bequest of any particular portion of, or article belonging to, the personal estate of the testator, as distinguished from all others of the same kind; as a bequest of a sum of money, or a horse.

A specific legacy is a bequest of property specifically designated, so as to be definitely distinguished from the rest of the testator's estate; as, a bequest of all the money contained in a certain box, or the horse in the testator's stable.

A demonstrative legacy is a bequest of a certain amount of money to be paid out of a particular fund; as, a bequest of $500 to be paid out of the proceeds of the sale of certain property.

An executor should first extinguish all the lawful debts of the testator, and for this purpose all the personal property may be applied, if necessary, even though some of it has been bequeathed in specific legacies. After the debts are paid, the specific legacies are next to be satisfied; then the demonstrative legacies; and lastly, the general legacies. If there be insufficient assets to satisfy any of the legacies in either of these three classes successively, those in the same class will be paid ratably and in proportion, and subsequent classes will fail entirely.

Residuary legatees take subject to all other legacies. A residuary legatee is one to whom is bequeathed "all the rest, residue and remainder" of an estate.

Specific and general legacies are subject to ademption; thus, if the testator bequeath "the horse in his stable." and at the time of his death has no horse, the legacy fails entirely and is said to be "adeemed." Or, if the legacy bequeaths the furniture in a certain specified house, and the testator remove the furniture to another house, the legacy is adeemed.

Legacies are vested, or contingent. A vested legacy is one where the legatee acquires an absolute present right to present or future enjoyment. A contingent legacy is one where the right of enjoyment depends upon some contingency; as, a gift to a child *if* he attains the age of twenty-one years. A cumulative legacy is one additional to a previous legacy contained in the same will.

In New York, and several other States, a legacy given to a subscribing witness of a will is void. An executor may be a legatee. It is also provided that "no person having a husband, wife, child, or parent, shall bequeath to a corporation more than one half of his personal estate after the payment of his debts."

Legacies are not required to be paid in less than one year from the time of the testator's death. This time is allowed to the executor to enable him to ascertain the nature and value of the property, the full liabilities of the testator and to collect the assets.

A legacy to an infant should not be paid except under order of the court, and such order will be governed by the laws of the State.

DON'T become an executor or administrator unless you are willing and have time to attend to the duties, and don't enter upon a trust until you thoroughly understand your duties and powers.

DON'T mix trust and personal funds.

DON'T pay out a dollar of trust money without proper vouchers, and don't fail to keep accurate accounts.

DON'T liquidate any claim until you have the whole estate in hand.

DON'T pay a bequest before the time fixed in the will without deducting interest.

DON'T give a promissory note as executor or administrator.

DON'T execute a contested will, or compromise a claim due an estate, without the advice and consent of the court.

DON'T incur any other expenses than those of the burial until the will is properly probated, but do not hesitate to sell perishable property.

The Right of Dower.

Dower is one-third part of the husband's estate, and in general cannot be destroyed by the mere act of the husband. Hence, in the sale of real estate by the husband, his wife must, with the husband, sign the conveyance to make the title complete to the purchaser. In the absence of such signature, the widow can claim full dower rights after the husband's death. Creditors, also, seize the property subject to such dowry rights.

The husband in his will sometimes gives his wife property in lieu of dowery. In this case she may, after his death, elect to take either such property or her dower; but she cannot take both. While the husband lives the wife's right of dower is only *inchoate;* it cannot be enforced. Should he sell the land to a stranger, she has no right of action or remedy until his death.

In all cases the law of the State *in which the land is situated* governs it, and, as in the case of heirship, full information must be sought for in statute which is applicable.

Marriage and Divorce.

Marriage may be entered into by any two persons, with the following exceptions: Idiots, lunatics, persons of unsound mind, persons related by blood or affinity within certain degrees prohibited by law, infants under the age of consent, which varies in the different States, and all persons already married and not legally divorced.

The violation of the marriage vow is cause for absolute divorce in all the States and Territories, excepting South Carolina and New Mexico, which have no divorce laws.

Physical inability is a cause in all the States *except* Cal., Conn., Dak., Ia., La., N. M., N. Y., S. C., Tex. and Vt. In most of these States it renders marriage voidable.

Willful desertion, one year, in Ark., Cal., Col., Dak., Fla., Ida., Kan., Ky., Mo., Mon., Nev., Utah, Wis., W. T. and Wyo.

Willful desertion, two years, in Ala., Ariz., Ill., Ind., Ia., Mich., Miss., Neb., Pa. and Tenn.

Willful desertion, three years, in Conn., Del., Ga., Me., Md., Mass., Minn., N. H., N. J., O., Ore., Tex., Vt. and W. Va.

Willful desertion, five years, in Va. and R. I., though the court *may* in the latter State decree a divorce for a shorter period.

Habitual drunkenness, in all the States and Territories, *except* Md., N. J., N. Y., N. C., Pa., S. C., Tex., Vt., Va. and W. Va.

"Imprisonment for felony" or "conviction of felony" in all the States and Territories (with limitations), *except* Dak., Fla., Me., Md., N. J., N. M., N. Y., N. C., S. C. and Utah.

"Cruel and abusive treatment," "Intolerable cruelty," "extreme cruelty," "repeated cruelty," or "inhuman treatment," in all the States and Territories *except* N. J., N. M., N. Y., N. C., S. C., Va. and W. Va.

Failure by the husband to provide: one year in Cal., Col., Dak., Nev. and Wyo.; two years in Ind. and Ida.; no time specified in Ariz., Ida., Mass., Mich., Me., Neb, R. I., Vt. and Wis.; willful neglect for three years in Del.

Fraud and fraudulent contract in Ariz., Conn., Ga., Ida., Kan., Ky., O., Pa. and W. T.

Absence without being heard from: three years in N. H.; seven years in Conn. and Vt.; separation five years, in Ky.; voluntary separation, five years, in Wis. When reasonably presumed dead by the court, in R. I.

"Ungovernable temper," in Ky.; "habitual indulgence in violent and ungovernable temper," in Fla.; "cruel treatment, outrages or excesses as to render their living together insupportable," in Ark., Ky., La., Mo., Tenn. and Tex.; "indignities as render life burdensome," in Mo., Ore., Pa., Tenn., W. T. and Wyo.

In Ga. an absolute divorce is granted only after the concurrent verdict of two juries at different terms of the court. In N. Y. absolute divorce is granted for but one cause, adultery.

All of the causes above enumerated are for absolute or full divorce, and collusion and connivance are especially barred, and also condonation of violation of the marriage vow.

The courts of every State, and particularly of New York, are very jealous of their jurisdiction, and generally refuse to recognize as valid a divorce against one of the citizens of the State by the court of another State, unless both parties to the suit were subject at the same time to the jurisdiction of the court granting the divorce.

Previous Residence Required.—Dak., ninety days; Cal., Ind., Ida., Neb., Nev., N. M., Tex. and Wyoming, six months; Ala., Ariz., Ark., Col., Ill., Ia., Kan., Ky., Me., Miss., Minn., Mich., Mo., Mont., N. H., O., Ore., Pa., Utah, Vt. (both parties as husband and wife), W. Va., W. T. and Wis., one year; Fla., Md., N. C., R. I. and Tenn., two years; Conn and Mass. (if, when married, both parties were residents; otherwise five years), three years.

Remarriage.—There are no restrictions upon remarriage by divorced persons in Conn., Ky., Ill. and Minn. Defendant must wait two years and obtain permission from the court in Mass. The decree of the court may restrain the guilty party from remarrying in Va. Parties cannot remarry until after two years, except

by permission of the court, in Me. In N. Y. the plaintiff may remarry, but the defendant cannot do so during the plaintiff's lifetime, unless the decree be modified or proof that five years have elapsed, and that complainant has married again and defendant's conduct has been uniformly good. Any violation of this is punished as bigamy, even though the other party has been married. In Del., Pa. and Tenn., no wife or husband divorced for violation of the marriage vow can marry the *particeps criminis* during the life of the former husband or wife, nor in La. at any time; such marriage in La. renders the person divorced guilty of bigamy.

Rights of Married Women.

Any and all property which a woman owns at her marriage, together with the rents, issues and profits thereof, and the property that comes to her by descent, devise, bequest, gift or grant, or which she acquires by her trade, business labor, or services performed on her separate account, shall, notwithstanding her marriage, remain her sole and separate property, and may be used, collected and invested by her in her own name, and shall not be subject to the interference or control of her husband, or be liable for his debts, unless for such debts as may have been contracted for the support of herself or children by her as his agent.

A married woman may likewise bargain, sell, assign, transfer and convey such property, and enter into contracts regarding the same on her separate trade, labor or business with the like effect as if she were unmarried. Her husband, however, is not liable for such contracts, and they do not render him or his property in any way liable therefor. She may also sue and be sued in all matters having relation to her sole and separate property in the same manner as if she were sole.

In the following cases a married woman's contract may be enforced against her and her separate estate: 1. When the contract is created in or respecting the carrying on of the trade or business of the wife. 2. When it relates to or is made for the benefit of her sole or separate estate. 3. When the intention to charge the separate estate is expressed in the contract creating the liability.

When a husband receives a principal sum of money belonging to his wife, the law presumes he receives it for her use, and he must account for it, or expend it on her account by her authority or direction, or that she gave it to him as a gift.

If he receives interest or income and spends it with her knowledge and without objection, a gift will be presumed from acquiescence.

Money received by a husband from his wife and expended by him, under her direction, on his land, in improving the home of the family, is a gift, and cannot be recovered by the wife, or reclaimed, or an account demanded.

An appropriation by a wife, herself, of her separate property to the use and benefit of her husband, in the absence of an agree-

ment to repay, or any circumstances from which such an agreement can be inferred, will not create the relation of debtor and creditor, nor render the husband liable to account.

Though no words of gift be spoken, a gift by a wife to her husband may be shown by the very nature of the transaction, or appear from the attending circumstances.

A wife who causelessly deserts her husband is not entitled to the aid of a court of equity in getting possession of such chattels as she has contributed to the furnishing and adornment of her husband's house. Her legal title remains, and she could convey her interest to a third party by sale, and said party would have a good title, unless her husband should prove a gift.

Wife's property is not liable to a lien of a sub-contractor for materials furnished to the husband for the erection of a building thereon, where it is not shown that the wife was notified of the intention to furnish the materials, or a settlement made with the contractor and given to the wife, her agent or trustee.

The common law of the United States has some curious provisions regarding the rights of married women, though in all the States there are statutory provisions essentially modifying this law. As it now stands the husband is responsible for necessaries supplied to the wife even should he not fail to supply them himself, and is held liable if he turn her from his house, or otherwise separates himself from her without good cause. He is not held liable if the wife deserts him, or if he turns her away for good cause. If she leaves him through good cause, then he is liable. If a man lives with a woman as his wife, and so represents her, even though this representation is made to one who knows she is not, he is liable the same way as if she were his wife.

Arbitration.

Arbitration is an investigation and determination of subjects of difference between persons involved in dispute, by unofficial persons chosen by the parties in question.

The general rule is that any person capable of making a valid contract concerning the subject in dispute may be a party to an arbitration. Any matter which the parties may adjust by agreement, or which may be made the subject of a suit at law, may be determined by arbitration. Crimes cannot be made the subject matter of an arbitration. This matter is regulated by statute in the different States.

The Law of Finding.

The general rule is that the finder has a clear title against every one but the owner. The proprietor of a hotel or a shop

has no right to demand property of others found on his premises. Such proprietor may make regulations in regard to lost property which will bind their employes, but they cannot bind the public. The finder has been held to stand in the place of the owner, so that he was permitted to prevail in an action against a person who found an article which the plaintiff had originally found, but subsequently lost. The police have no special rights in regard to articles lost, unless those rights are conferred by statute. Receivers of articles found are trustees for the owner or finder. They have no power in the absence of special statute to keep an article against the finder, any more than the finder has to retain an article against the owner.

Number of Miles by Water from New York to

Amsterdam	3,510	Kingston	1,640
Bermudas	660	Lima	11,310
Bombay	11,574	Liverpool	3,210
Boston	310	London	3,375
Buenos Ayres	7,110	Madras	11,850
Calcutta	12,425	Naples	4,330
Canton	13,900	New Orleans	2,045
Cape Horn	8,115	Panama	2,358
Cape of Good Hope	6,830	Pekin	15,325
Charleston	750	Philadelphia	240
Columbia River	15,965	Quebec	1,400
Constantinople	5,140	Rio Janeiro	3,840
Dublin	3,225	Sandwich Islands	15,300
Gibraltar	3,300	San Francisco	15,858
Halifax	612	St. Petersburg	4,420
Hamburg	3,775	Valparaiso	9,750
Havana	1,420	Washington	400
Havre	3,210	Around the Globe	25,000

Dimensions of the Oceans.

	Area, Sq. Miles.	Av. Depth.		Area, Sq. Miles.	Av. Depth.
Pacific	68,000,000	12,780 feet	Antarctic	8,500,000	6,000 feet
Atlantic	35,000,000	12,060 "	Arctic	5,000,000	5,100 "
Indian	25,000,000	10,980 "			

Inland Seas of the World.

Name.	Area, Sq. Miles.	Depth.	Name.	Area, Sq. Miles.	Depth.
Caspian Sea	176,000	250 ft.	Lake Erie	10,815	204 ft.
Sea of Aral	30,000	100 "	Lake Ontario	6,300	336 "
Dead Sea	303	200 "	Lake Nicaragua	6,000	300 "
Lake Balkal	12,000	750 "	Lake Titacaca	3,012	800 "
Lake Superior	32,000	1,000 "	Salt Lake	1,875	1,400 "
Lake Michigan	22,400	1,000 "	Lake Tchad	14,000	350 "
Lake Huron	21,000	1,000 "	Lake Lodoga	12,000	1,200 "

BUSINESS AND LEGAL FORMS.

SHORT FORM OF ASSIGNMENT OF WRITTEN INSTRUMENT.

FOR VALUE RECEIVED, I do hereby assign, transfer and set over unto C D, and his assigns, all my right, title and interest in and to the within written instrument, this ..... day of ....., A.D. 1890.

A B.

ORDINARY BILL OF EXCHANGE, OR DRAFT AT A TIME AFTER SIGHT.

$250. Chicago, January 1, 1890.

Ten days after sight, pay to the order of W F, *two hundred and fifty* dollars, for value received, and charge the same to account of

To M. B. & Co., *New York City, N. Y.* J. H. C. & Co., *Chicago, Illinois.*

When a draft is payable at sight, commence thus:

"At sight, pay," etc.

GENERAL FORM OF AGREEMENT.

THIS AGREEMENT, made this ..... day of ....., one thousand eight hundred and ....., between A B, of ....., county of ....., and State of Illinois, of the first part, and C D, of ....., in said county and State, of the second part—

Witnesseth, that the said A B, in consideration of the covenants and agreements on the part of the party of the second part hereinafter contained, doth covenant and agree to and with the said C D, that (here insert the agreement on the part of A B).

And the said C D, in consideration of the covenants on the part of the party of the first part, doth covenant and agree to and with the said A B, that (here insert the agreement on the part of C D).

IN WITNESS WHEREOF, we have hereunto set our hands and seals, the day and year first above written.

A B. [SEAL.]
C D. [SEAL.]

COMMON FORM OF BOND FOR PAYMENT OF MONEY.

KNOW ALL MEN BY THESE PRESENTS, that I, A B, of ....., in the county of ....., and State of Illinois, am held and firmly bound unto C D, of ..... , in the county of ....., and State aforesaid, in the sum of . .... dollars, to be paid to the said C D, his executors, administrators and assigns, to which payment, well and truly to be made, I bind myself, my heirs, executors and administrators, and every of them, firmly by these presents.

Sealed with my seal, the ..... day of ....., A.D. 1890.

The condition of this obligation is such, that if the above bound A B, his heirs, executors and administrators, or either of them, shall well and truly pay, or cause to be paid, unto the said C D, his executors, administrators or assigns, the just and full sum of ..... dollars, with interest thereon, at the yearly rate of ..... per cent. for the same, on or before the ..... day of ....., A.D. 1890, then this obligation to be void and of no effect; otherwise to remain in full force.

A B. [SEAL.]

FORM OF BILL OF SALE OF GOODS OR PERSONAL PROPERTY.

KNOW ALL MEN BY THESE PRESENTS, that I, A B, of ....., in the county of ....., and State of Illinois, in consideration of the sum of ..... dollars, to me paid by C D, of ....., at and before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, have bargained, sold and delivered, and by these presents do bargain, sell and deliver unto the said C D, the following goods and chattels, towit: (Here insert a bill of particular goods sold or personal property).

To have and to hold the said goods and chattels unto the said C D, his executors, administrators and assigns, to his and their own proper use and benefit forever. And I, the said A B, for myself and my heirs, executors and administrators, do warrant and will defend the said bargained premises unto the said C D., his executors, administrators and assigns, from and against all persons whomsoever.

IN WITNESS WHEREOF, I have hereunto set my hand and seal, this ..... day of ....., A.D. 1890.

A B. [SEAL.]

FORM OF BOND FOR A DEED.

KNOW ALL MEN BY THESE PRESENTS, that I, A B, of the county of ....., and State of Illinois, am held and firmly bound unto C D, of the county of ....., and State aforesaid, in the penal sum of ..... dollars, to be paid unto the said E F, his heirs, executors, administrators or assigns, to which payment, well and truly to be made, I bind myself, my heirs, executors and administrators, and every of them, firmly by these presents.

Sealed with my seal, this ..... day of ....., A.D. 1890.

The condition of the above obligation is such, that whereas the above bounden A B has this day bargained and sold to the said C D, his heirs and assigns, for the sum of ..... dollars, the following described lot or parcel of land, to-wit: (here describe the land,) which sum of ..... dollars is to be paid in manner following: ..... dollars at the ensealing and delivery hereof, and ..... dollars in ..... from the date hereof.

Upon the payment of the said sums being made, at the time and in the manner aforesaid, the said A B, for himself, his heirs, executors and assigns, covenants and agrees, to and with the said C D, his heirs and assigns, to execute a good and sufficient deed of conveyance, in fee simple, free from all incumbrance, with full and proper covenants of warranty for the above described premises.

Now, if the said A B shall well and truly keep, observe and perform his said covenants and agreements herein contained, on his part, then this obligation to be void; otherwise to remain in full force and virtue. A B. [SEAL.]

POWER OF ATTORNEY.

KNOW ALL MEN BY THESE PRESENTS, that I, A B, of ....., in the county of ....., and State of Illinois, have made, constituted and appointed, and by these presents do make, constitute and appoint, C D, of ....., to be my true and lawful attorney, for me and in my name, and for my sole use, to (here state the specific purposes of the power given), hereby giving and granting unto my said attorney full power and authority in the premises to use all lawful means in my name, and for my sole benefit for the purposes aforesaid. And generally to do and perform all such acts, matters and things as my said attorney shall deem necessary or expedient for the completion of the authority hereby given, as fully as I might and could do if I were personally present; hereby ratifying and confirming all the acts of my said attorney or his substitutes, done by virtue of these presents.

IN WITNESS WHEREOF, I have hereunto set my hand and seal, this ..... day of ....., A.D. 1890. A P. [SEAL.]

WARRANTY DEED.

The grantor (here insert name or names and place of residence), for and in consideration of (here insert consideration) in hand paid, conveys and warrants to (here insert the grantee's name or names) the following described real estate (here insert description), situated in the county of ....., in the State of Illinois.

Dated this ..... day of ....., A.D. 18.. A B. [SEAL.]

QUIT CLAIM DEED.

The grantor (here insert grantor's name or names and place of residence), for the consideration of (here insert consideration), convey and quit claim to (here insert grantee's name or names) all interest in the following described real estate (here insert description), situated in the county of ....., in the State of Illinois.

Dated this ..... day of ....., A.D. 18.. A B. [SEAL.]

MORTGAGE.

The mortgagor (here insert name or names) mortgages and warrants to (here insert name or names of mortgagee or mortgagees), to secure the payment of (here recite the nature and amount of indebtedness, showing when due and the rate of interest, and whether secured by note or otherwise), the following described real estate (here insert description thereof), situated in the county of ....., in the State of Illinois. A B. [SEAL.]

Dated this ..... day of ....., A.D. 18..

FORM OF CERTIFICATE OF ACKNOWLEDGMENT TO DEED OR OTHER INSTRUMENT.

State of (name of State), }
County of (name of County). }

I (here give name of officer and his official title) do hereby certify that (name of grantor, and if acknowledged by wife, her name, and add "his wife,") personally

known to me to be the same person whose name is (or are) subscribed to the foregoing instrument, appeared before me this day in person, and acknowledged that he (she or they) signed, sealed or delivered the said instrument as his (her or their) free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and (private or official, as the case may be) seal, this .....day of....., A.D. 18.. (Signature of officer.) [SEAL.]

SHORT FORM OF LEASE.

THIS INDENTURE, made this ..... day of ....., A.D. 18.., between A B, party of the first part, and C D, party of the second part, witnesseth, that the said party of the first part, in consideration of the covenants of the party of the second part, hereinafter set forth, do..by these presents, lease to the party of the second part, the following described property, to-wit: (here describe the premises), in the county of ....., and State of ..... To have and to hold the same, to the party of the second part, from the ..... day of....., 18.., to the ..... day of....., 18.. And the party of the second part, in consideration of the leasing of said premises, covenants and agrees to pay the party of the first part, at ....., as rent for the same, the sum of ....., payable as follows, to-wit: (Here set forth the terms of payment.)

And the party of the second part covenants with the party of the first part that at the expiration of the term of this lease..he..will yield up the premises to the party of the first part, without further notice, in as good condition as when the same were entered upon by the party of the second part, loss by fire or inevitable accident and ordinary wear excepted, and that neither..he..nor.....legal representatives will underlet said premises, or any part thereof, or assign this lease, without the written assent of the party of the first part first had thereto.

And it is further expressly agreed between the parties hereto, that if default shall be made in the payment of the rent above reserved, or any part thereof, or any of the covenants or agreements herein contained to be kept by the party of the second part, it shall be lawful for the party of the first part or.....legal representatives, into and upon said premises, or any part thereof, either with or without process of law, to re-enter and re-possess the same at the election of the party of the first part, and to distrain for any rent that may be due thereon upon any property belonging to the party of the second part. And in order to enforce a forfeiture for non-payment of rent, it shall not be necessary to make a demand on the same day the rent shall become due, but a failure to pay the same at the place aforesaid, or a demand and a refusal to pay on the same day or at any time on any subsequent day, shall be sufficient; and after such default shall be made, the party of the second part and all persons in possession under ..... shall be deemed guilty of a forcible detainer of said premises under the statute.

And it is further covenanted and agreed between said parties that (here set forth any further stipulation agreed upon.) The covenants herein shall extend to and be binding upon the heirs, executors and administrators of the parties to this lease.

Witness the hands and seals of said parties, the day and year first above writen.

A B. [SEAL.]
C D. [SEAL.]

FORM OF WILL.

I, A B, of ....., in the county of ....., and State of Illinois, of the age of ..... years, of sound mind and memory, do make, publish and declare this my last will and testament in the manner following: That is to say,

First, I give and bequeath to (here may be set forth the manner of disposition of personal property, and the names of persons and amount to each.)

Second, I give and devise to (here set forth the manner of disposition of real property, and the names of persons to whom devised, concluding as follows:) To have and to hold the same and the several tracts and parcels thereof to the said ....., his heirs and assigns forever.

And lastly, I do hereby nominate and appoint ..... to be executor of this my last will and testament, hereby revoking all former wills by me made. (Add the following clause if desired:) And I do direct that my said executor shall not be obliged to give security as such.

In witness whereof, I have hereunto set my hand and seal this ..... day of ....., A.D. 18..

A B. [SEAL.]

The above instrument, consisting of one sheet (or two sheets, as the case may be) was at the date thereof signed, sealed, published and declared by the said A B as and for his last will and testament, in presence of us, who, at his request and in his presence, and in the presence of each other, have subscribed our names as witnesses thereto (or, "the above instrument, consisting of *one* sheet was at the date thereof, declared to us by the said A B, the testator therein mentioned, to be his last will and testament; and at the same time acknowledged to us, and each of us, that he had signed and sealed the same, and we therefore, at his request and in his presence, and in the presence of each other, signed our names thereto as attesting witnesses.)"

C D, residing at ....., in ..... county.
G H, residing at ....., in ..... county.

The foregoing is the general form of will, which can be varied in case of several devisees and legatees, according to the facts or as circumstances may require.

A *devisee* is one to whom *real* property is devised in the will.

A *legatee* is one to whom *personal* property is given in the will.

BILL OF SALE.

KNOW ALL MEN BY THESE PRESENTS, that I, E D, of the town of ....., county of ....., State of ....., of the first part, for and in consideration of the sum of one hundred dollars, lawful money of the United States, to me in hand paid, at or before the ensealing and delivery of these presents, by C B, of the second part, the receipt whereof is hereby acknowledged, have bargained, sold, granted and conveyed, and by these presents do bargain, sell, grant and convey unto the said party of the second part, his executors, administrators and assigns (here set out the articles sold), to have and to hold the same unto the said party of the second part, his executors, administrators and assigns, forever. And I do for myself, my heirs, executors and administrators, covenant and agree to and with the said party of the second part, to warrant and defend the said described goods hereby sold unto the said party of the second part, his executors, administrators and assigns, against all and every person and persons whatsoever.

IN WITNESS WHEREOF, I have hereunto set my hand and seal the ..... day of ....., 18..

E D. [SEAL.]

Signed, sealed and delivered in the presence of B B.

PROMISSORY NOTE.

$200. Baltimore,....., 18..

Thirty days after date I promise to pay B B, or order (or bearer), two hundred dollars, for value received.

B. E.

JOINT PROMISSORY NOTE.

$1,050. Memphis,....., 18..

Sixty days after date we jointly promise to pay C D, or order (or bearer), one thousand and fifty dollars, for value received.

A C.
B H.

NOTE PAYABLE ON DEMAND.

$100. Mobile,....., 18..

On demand, for value received, I promise to pay H B, or order (or bearer), one hundred dollars (with interest).

C. C.

NOTE PAYABLE AT BANK.

$300. St. Louis,....., 18..

Thirty days after date, for value received, I promise to pay C D A, or order (or bearer), three hundred dollars, at the German-American Savings Bank.

D R S.

NOTE NOT NEGOTIABLE.

$100. Madison,....., Ga., 18..

Two months after date I promise to pay J H, one hundred dollars, for value received.

B B.

NOTE WITH SURETY.

$75. Columbus, Miss.,....., 18..

Six months from date I promise to pay E G, or order (or bearer), seventy-five dollars, for value received.

B B.
X X.

NOTE PAYABLE BY INSTALLMENTS.

$500. Albany, ..., 18..

For value received, I promise to pay A C, or order (or bearer), five hundred dollars, in the following manner: One hundred dollars in three months, two hundred dollars in nine months, one hundred dollars in twelve months, and one hundred dollars in fifteen months, from date, with interest on the several sums as they may become due.

W Z.

DUE BILL.

$50. Cincinnati, ..., 18..

Due A W, fifty dollars, with interest from this date.

M A.

DRAFT AT SIGHT.

$100. Chicago, ... , 18..

At sight, pay J C, or order, one hundred dollars, and charge the same to my account

C E B.

To A X.

BILL OF EXCHANGE.

$500. New York, ..., 18..

Fifteen days after sight (or as many days as may be agreed upon), pay to the order of Mr. B B, five hundred dollars, and charge the same to the account of

To L M, St. Louis, Mo.

C D.

HIGH WATER

At the following places may be found for each day by adding to, or substracting from, the time of high water at New York the hours and minutes given. The * denotes time to be *added*; the † to be *subtracted*. The interval between tides is approximately twelve hours.

	Time.		Time.
Albany, N. Y.*	9:39	Newport, R. I.†	0:22
Annapolis, Md.*	8:57	Norfolk, Va.*	0:56
Atlantic City, N. J.†	0:18	Norwich, Conn.*	2:05
Baltimore, Md.*	10:52	Old Point Comfort, Va.*	0:37
Block Island, R. I.†	0:53	Philadelphia, Pa.*	5:37
Boston, Mass.*	3:22	Plymouth, Mass.*	3:12
Bridgeport, Conn.*	3:04	Point Lookout, Me.*	4:49
Bristol, R. I.†	0:02	Portland, Me.*	3:10
Cape May, N. J.*	0:12	Portsmouth, N. H.*	3:16
Charleston, S. C.†	0:43	Poughkeepsie, N. Y.*	4:27
Eastport, Me.*	3:01	Providence, R. I.*	0:07
Fernandina, Fla.†	0:19	Richmond, Va.*	8:47
Gloucester, Mass.*	2:57	Rockaway Inlet, N. Y.†	0:26
Isles of Shoals*	3:11	Rockland, Me.*	2:55
Jacksonville, Fla.*	0:36	Rockport, Mass.*	2:50
Key West, Fla.*	1:23	Salem, Mass.*	3:05
Marblehead, Mass.*	3:04	Sandy Hook, N. J.*	0:36
Nahant, Mass.*	3:02	Savannah, Ga.†	0:49
Nantucket, Mass.*	4:31	Vineyard Haven, Mass.*	3:35
New Bedford, Mass.*	0:10	Washington, D. C.*	11:54
Newburyport, Mass.*	3:29	Watch Hill, R. I.*	0:53
New Haven, Conn.*	3:01	West Point, N. Y.*	2:55
New London, Conn.*	1:16	Wilmington, N. C.*	0:59

Interest Laws and Statutes of Limitations.

States and Territories.	Interest Laws.		Statutes of Limitations.		
	Legal Rate.	Rate Allowed by Contract.	Judgments, Years.	Notes, Years.	Open Acc'nts Years.
	Per Ct.	Per Cent.			
Alabama	8	8	20	6	3
Arkansas	6	10	10	5	3
Arizona	10	12	5	3	2
California	7	Any rate	5	4	2
Colorado	10	Any rate	6	6	6
Connecticut	6	†	..	6	6
Dakota	7	Any rate	20	6	6
Delaware	6	6	20	6	3
District of Columbia	6	10	12	3	3
Florida	8	Any rate	20	5	2
Georgia	7	8	7	7	4
Idaho	10	18	6	6	3
Illinois	6	8	7	10	5
Indiana	6	8	10	10	6
Iowa	6	10	10	10	5
Kansas	7	12	5	5	2
Kentucky	6	8	15	15	5
Louisiana	5	8	10	5	3
Maine	6	Any rate	20	6	6
Maryland	6	6	12	3	3
Massachusetts	6	Any rate	20	6	6
Michigan	7	10	6	6	6
Minnesota	7	10	10	6	6
Mississippi	6	10	7	6	3
Missouri	6	10	20	10	5
Montana	10	Any rate	6	6	2
Nebraska	7	10	5	5	4
Nevada	10	Any rate	6	6	4
New Hampshire	6	6	20	6	6
New Jersey	6	6	20	6	6
New Mexico	6	12	15	6	4
New York	6	6*	20	6	6
North Carolina	6	8	10	3	3
Ohio	6	8	5	15	6
Oregon	8	10	10	6	1
Pennsylvania	6	6	5	6	6
Rhode Island	6	Any rate	20	6	6
South Carolina	7	10	10	6	6

* New York has by a recent law legalized any rate of interest on call loans of $5,000 or upward, on collateral security. † No usury, but over six per cent. cannot be collected by law.

States and Territories.	Interest Laws.		Statutes of Limitations.		
	Legal Rate.	Rate Allowed by Contract.	Judgments, Years.	Notes, Years.	Open Acc'nts Years.
	Per Ct.	Per Cent.			
Tennessee	6	6	10	6	6
Texas	8	12	15	4	2
Utah	10	Any rate	5	4	2
Vermont	6	6	6	6	6
Virginia	6	8	10	5	2
Washington Territory	10	Any rate	6	6	3
West Virginia	6	†	10	10	5
Wisconsin	7	10	20	6	6
Wyoming	12	Any rate	5	5	4

† No usury, but over six per cent. cannot be collected by law.

A TRIP AROUND THE WORLD.

From Atlantic cities to Omaha, Neb., via the great trunk lines of railway—about 1,400 miles, in 2 days and 2 hours.

From Omaha to San Francisco, Cal., via Union and Central Pacific railroads—1,914, in 4 days and 6 hours.

From San Francisco to Yokohama, Japan, by Pacific Mail line of steamers—4,700 miles, in 22 days.

From Yokohama to Hong Kong, China, by Pacific Mail or Peninsular and Oriental steamers—1,600 miles, in 6 days.

From Hong Kong to Calcutta, India, by Peninsular and Oriental steamers—3,500 miles in 14 days.

From Calcutta to Bombay, India, by the East Indian and Great Indian Peninsular railways—1,450 miles, in 3 days.

From Bombay to Suez, Egypt, by Peninsular and Oriental steamers—3,600 miles, in 14 days.

From Suez to Alexandria, Egypt, by rail—225 miles, in 10 hours.

From Alexandria to Brindisi, Italy, by Peninsular and Oriental steamers—850 miles, in 3 days.

Brindisi to London, Eng., by rail, via Paris or the Rhine—1,200 miles, in 3 days.

From London to Liverpool, Eng., by railway—200 miles, in 6 hours.

From Liverpool to the Atlantic cities, America, by either of the great Atlantic steamship lines—3,000 miles, in 10 days.

Total distance, 23,639 miles. Time, 82 days. Fare, about $1,100, with $4 per day for meals and incidentals; the total cost of the trip, $1,500.

U. S. MINING LAWS.

Valuable Information for Owners and Locators of Mines.

WHERE papers have once been filed with the Register and Receiver, they become a part of the record, and can neither be withdrawn nor returned, but must be transmitted to the General Land Office.

An application will be rejected when the description of the premises is erroneous or insufficient.

Application for patent will be rejected because:

1. The notice was published without the knowledge of the Register.
2. The notice was not published in a newspaper designated as published nearest the claim.
3. Record title was found defective; and,
4. A previous application had been made for the same premises, which was withdrawn pending a suit in court commenced by the adverse claimant.

An application for patent will be rejected when the survey does not accurately define the boundaries of the claim.

Where the claim was not located in accordance with law.

Where several parties own separate and distinct portions of a claim, application for patent may be made by either for that portion of the claim owned by him; but where several parties own undivided interests in a mining claim, all should join in an application for a patent.

A person or association may purchase as many placer locations as the local law admits, and embrace them all in one application for a patent.

Two or more lodes cannot be embraced in one application for a patent except for placer claims embracing two or more lodes within their boundaries.

Paper sworn to before any person purporting to act as a deputy for the Register and Receiver, cannot be recorded as evidence.

In all patents for mining claims situated within the interior boundaries of a town site a clause is inserted "excepting and excluding all town property, rights upon the surface, and all houses, buildings, structures, lots, blocks, streets, alleys, or other municipal improvements not belonging to the grantee herein, and all rights necessary or proper to the occupation, possession and enjoyment of the same."

Publication of notice must be made in only one newspaper for the period of sixty days

Notice must be published ten consecutive weeks in weekly newspapers, and in daily newspapers sixty days must elapse between the first and last insertion.

Where the Register designates the daily issue of a newspaper for publication of notices of a mining application for patent, it is not a compliance with law to change to the weekly edition of the same paper, without authority of the Register.

The existence of a salt spring on a tract of land withdraws it from the operation of the homestead and pre-emption laws. A hearing for the purpose of proving the agricultural character of such lands is not allowed. Land containing valuable deposits of slate may be entered under the mining acts.

Adverse Claims.

Adverse claimants must file a separate and distinct claim against each application which it is alleged conflicts with the premises owned by such adverse claimant.

The papers in an adverse claim once filed cannot be withdrawn, but become part of the record.

When an adverse claim has been filed it cannot be amended so as to embrace a larger portion of the premises than that described in the original adverse claim.

An adverse claim must be made out in proper form and filed in the proper local office during the period of publication of the application for the patent to be effective.

It is the duty of the adverse claimant to commence suit in proper form within the required time, and if he trusts the uncertain medium of the United States mail, he must abide the consequences, should the delay ensue through misfortune or accident. Should the failure to commence suit be the result of the corrupt or dishonest action of his attorney, the Interior Department cannot redress the wrong.

An adverse claimant should set forth in detail the facts upon which he bases his adverse claim. A statement in general terms, embodying conclusions of law, without stating the facts generally, will not be considered in evidence.

An adverse claimant should show a compliance with the local laws in recording his claim and in regard to expenditures, and shall file a copy of the original notice of his location, and show the nature or extent of the conflict alleged.

An allegation of parties to a suit that they compose the company is sufficient, and they are not required to prove that they are the original locators or the identical parties who presented the adverse claim.

Agricultural or Mineral Lands.

Where land is of little if any value for agricultural purposes, but is essential to the proper development of mining claims, it should be disposed of under the Mining Act.

Where lands containing valuable mineral deposits have been included in an agricultural entry, said entry will be canceled at any time prior to issuance of patent, upon satisfactory evidence of the existence of such valuable deposits.

Where valuable deposits of mineral are discovered upon a tract after the same has been entered as agricultural, but before patent has been issued, the parties claiming the mine might make application for patent for same, and the agricultural entry will be canceled to that portion of the land embraced by said mining claim.

Where mineral deposits are discovered on agricultural land after patent has been issued to an agricultural claimant, they pass with the patent.

Agricultural college scrip cannot be received in payment for claims.

Aliens.

A foreigner may make a mining location and dispose of it, provided he becomes a citizen before disposing of the mine. Proof that the party was not a citizen before disposing of his claim must be affirmatively shown.

Locators and intermediate owners other than applicants will not be presumed aliens in the absence of allegation or objection prior to issuance of patent.

The portion of a mining claim sold to an alien cannot be patented while such owner is an alien; but on his declaration to become a citizen his right dates back to his purchase, and he may thereupon secure a United States patent for his claim.

Tunnels.

There is no authority of law for a tunnel location 3,000 by 1,500 feet. A proper location is the width of the tunnel for 3,000 feet.

There is no provision of law for patenting tunnel locations, but lodes discovered in running a tunnel may be patented in like manner as other lodes.

When a lode is struck or discovered for the first time in running a tunnel, the tunnel owners have the option of recording their claim of 1,500 feet all on one side of the point of discovery or intersection, or partly on one side thereof and partly on the other.

Prospecting for blind lodes is prohibited on the line of a located tunnel, while the tunnel is in progress, but other parties are in no way debarred from prospecting for blind lodes or running tunnels, so long as they keep without the line of such tunnel.

The right is granted to tunnel owners to 1,500 feet of each blind lode not previously known to exist, which may be discovered in their tunnel.

Cross Ledges.

Revised Statutes. Section 2336. Where two or more ledges cross or intersect each other, priority of title shall govern, and such prior location shall be entitled to all ore or mineral contained within the space of intersection, but the subsequent

location shall have the right of way through the space of intersection for the purpose of the convenient working of the mine. And where two or more veins unite, the oldest or prior location shall take the vein below the point of union, including all the space of the intersection.

THE LAW OF COPYRIGHT.

1. A *printed* copy of the title (besides the two copies to be deposited after publication) of the book, map, chart, dramatic or musical composition, engraving, cut, print or photograph, or a *description* of the painting, drawing, chromo, statue, statuary or model or design for a work of the fine arts, for which copyright is desired, must be sent by mail or otherwise, *prepaid*, addressed "Librarian of Congress, Washington, D. C." This must be done before the publication of the book or other article. The applicant must state distinctly the name and residence of the claimant, and whether copyright is claimed as author, designer or proprietor. The *printed title* required may be a copy of the title page of such publications as have title pages. In other cases, the title must be printed expressly for copyright entry, with name of claimant of copyright. The style of type is immaterial, and the print of a typewriter will be accepted. But a separate title is required for each entry, and *each* title must be printed on paper as large as commercial note. The title of a *periodical* must include the date and number.

2. The legal fee for *recording* each copyright claim is 50 cents, and for a *copy* of this record (or certificate of copyright) an additional fee of 50 cents is required. Certificates covering more than one entry are not issued.

3. Within ten days after publication of each book or other article, two complete copies of the best edition issued must be sent, to perfect the copyright, with the address "Librarian of Congress, Washington, D. C." The postage must be prepaid, or else the publication inclosed in parcels covered by printed Penalty Labels, furnished by the Librarian, in which case they will come FREE by mail, without limit of weight. Without the deposit of copies above required the copyright is void, and a penalty of $25 is incurred.

4. No copyright is valid unless notice is given by inserting in every copy published, on the title page or the page following, if it be a book; or, if a map, chart, musical composition, print, cut, engraving, photograph, painting, drawing, chromo, statue, statuary or model design intended to be perfected as a work of the fine arts, by inscribing upon some portion thereof, or on the substance on which the same is mounted, the following words, viz: *"Entered according to act of Congress, in the year——, by———, in the office of the Librarian of Congress, at Washington,"* or, at the option of the person entering the copyright, the words: *"Copyright, 18—, by———."*

The law imposes a penalty of $100 upon any person who has not obtained a copyright who shall insert the notice *"Entered according to act of Congress,"* or *"Copyright,"* etc., or words of the same import, in or upon any book or other article.

5. Any author may reserve the right to translate or dramatize his own work. In this case, notice should be given by printing the words *"Right of translation reserved,"* or *"All rights reserved,"* below the notice of copyright entry, and notifying the Librarian of Congress of such reservation, to be entered upon the record.

6. The original term of copyright runs for twenty-eight years. *Within six months before* the end of that time, the author or designer, or his widow or children, may secure a renewal for the further term of fourteen years, making forty-two years in all.

7. The time within which any work entered for copyright may be issued from the press is not limited by any law or regulation, but depends upon the discretion of the proprietor. A copyright may be secured for a projected work as well as for a completed one. But the law provides for no *caveat*, or notice of interference—only for actual entry of title.

8. A copyright is assignable in law by any instrument of writing, but such assignment must be recorded in the office of the Librarian of Congress within sixty

days from its date. The fee for this record and certificate is $1, and for a certified copy of any record of assignment $1.

9. A copy of the record (or duplicate certificate) of any copyright entry will be furnished, under seal, at the rate of 50 cents each.

10. In the case of books published in more than one volume, or of periodicals published in numbers, or of engravings, photographs or other articles published with variations, a copyright is to be entered for each volume or part of a book, or number of a periodical, or variety, as to style, title or inscription, of any other article. But a book published serially in a periodical, under the same general title, requires only one entry. To *complete* the copyright on such a work, two copies of each serial part, as well as of the complete work (if published separately), must be deposited.

11. To secure a copyright for a painting, statue, or model or design intended to be perfected as a work of the fine arts, so as to prevent infringement by copying, engraving, or vending such design, a definite description must accompany the application for copyright, and a photograph of the same, at least as large as "cabinet size," should be mailed to the Librarian of Congress within ten days from the completion of the work or design.

12. Copyrights cannot be granted upon trademarks, nor upon mere names of companies or articles, nor upon prints or labels intended to be used with any article of manufacture. If protection for such names or labels is desired, application must be made to the Patent Office.

13. Citizens or residents of the United States only are entitled to copyright.

THE LAW OF TRADEMARKS.

Any person, firm or corporation can obtain protection for any lawful trademark by complying with the following:

1. By causing to be recorded in the Patent office the name, residence and place of business of persons desiring the trademark.
2. The class of merchandise and description of the same.
3. A description of the trademark itself with fac-similes.
4. The length of time that the said mark has already been used.
5. By payment of the required fee—$6.00 for labels and $25 for trademarks.
6. By complying with such regulations as may be prescribed by the commissioner of patents.
7. A lawful trademark must consist of some arbitrary word (not the name of a person or place), indicating or not the use or nature of the thing to which it is applied; of some designation symbol, or of both said word and symbol.

HOW TO OBTAIN A PATENT.

Patents are issued in the name of the United States, and under the seal of the Patent Office, to any person who has invented or discovered any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement thereof, not known or used by others in this country, and not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof, and not in public use or on sale for more than two years prior to his application, unless the same is proved to have been abandoned; and by any person who, by his own industry, genius, efforts and expense has invented and produced any new and original design for a manufacture, bust, statue, alto-relievo, or bas-relief; any

new and original design for the printing of woolen, silk, cotton or other fabrics; any new and original impression. ornament, pattern, print or picture to be printed, painted, cast or otherwise placed on or worked into any article of manufacture; or any new, useful and original shape or configuration of any article of manufacture, the same not having been known or used by others before his invention or production thereof, or patented or described in any printed publication, upon payment of the fees required by law and other due proceedings had.

Every patent contains a grant to the patentee, his heirs or assigns, for the term of seventeen years, of the exclusive right to make, use and vend the invention or discovery throughout the United States and the Territories, referring to the specification for the particulars thereof.

If it appear that the inventor, at the time of making his application, believed himself to be the first inventor or discoverer, a patent will not be refused on account of the invention or discovery, or any part thereof, having been known or used in any foreign country before his invention or discovery thereof, if it had not been before patented or described in any printed publication.

Joint inventors are entitled to a joint patent; neither can claim one separately. Independent inventors of distinct and independent improvements in the same machine cannot obtain a joint patent for their separate inventions; nor does the fact that one furnishes the capital and another makes the invention entitle them to make application as joint inventors; but in such case they may become joint patentees.

The receipt of letters patent from a foreign government will not prevent the inventor from obtaining a patent in the United States, unless the invention shall have been introduced into public use in the United States more than two years prior to the application. But every patent granted for an invention which has been previously patented by the same inventor in a foreign country will be so limited as to expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest unexpired term, but in no case will it be in force more than seventeen years.

Applications.

Application for a patent must be made in writing to the Commissioner of Patents. The applicant must also file in the Patent Office a written description of the same, and of the manner and process of making, constructing, compounding and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct, compound and use the same; and in case of a machine, he must explain the principle thereof, and the best mode in which he has contemplated applying that principle, so as to distinguish it from other inventions, and particularly point out and distinctly claim the part, improvement or combination which he claims as his invention or discovery. The specification and claim must be signed by the inventor and attested by two witnesses.

When the nature of the case admits of drawings, the applicant must furnish one copy signed by the inventor or his attorney in fact, and attested by two witnesses, to be filed in the Patent Office. In all cases which admit of representation by model, the applicant, if required by the Commissioner, shall furnish a model of convenient size to exhibit advantageously the several parts of his invention or discovery.

The applicant shall make oath that he verily believes himself to be the original and first inventor or discoverer of the art, machine, manufacture, composition or improvement for which he solicits a patent; that he does not know and does not believe that the same was ever before known or used, and shall state of what country he is a citizen. Such oath may be made before any person within the United States authorized by law to administer oaths, or, when the applicant resides in a foreign country, before any minister, charge d'affaires, consul or commercial agent,

holding commission under the Government of the United States, or before any notary public of the foreign country in which the applicant may be.

On the filing of such application and the payment of the fees required by law, if, on such examination, it appears that the claimant is justly entitled to a patent under the law, and that the same is sufficiently useful and important, the Commissioner will issue a patent therefor.

Assignments.

Every patent or any interest therein shall be assignable in law by an instrument in writing; and the patentee or his assigns or legal representatives may, in like manner, grant and convey an exclusive right under his patent to the whole or any specified part of the United States.

Reissues.

A reissue is granted to the original patentee, his legal representatives, or the assignees of the entire interest when, by reason of a defective or insufficient specification, or by reason of the patentee claiming as his invention or discovery more than he had a right to claim as new, the original patent is inoperative or invalid, provided the error has arisen from inadvertance, accident or mistake, and without any fraudulent or deceptive intention. In the cases of patents issued and assigned prior to July 8, 1870, the applications for reissue may be made by the assignees; but in the cases of patents issued or assigned since that date, the applications must be made and the specifications sworn to by the inventors, if they be living.

Caveats.

A caveat, under the patent law, is a notice given to the office of the caveator's claim as inventor, in order to prevent the grant of a patent to another for the same alleged invention upon an application filed during the life of the caveat without notice to the caveator.

Any citizen of the United States who has made a new invention or discovery, and desires further time to mature the same, may, on payment of a fee of $10, file in the Patent Office a caveat setting forth the object and the distinguishing characteristics of the invention, and praying protection of his right until he shall have matured his invention. Such caveat shall be filed in the confidential archives of the office and preserved in secrecy, and shall be operative for the term of one year from the filing thereof.

An alien has the same privilege, if he has resided in the United States one year next preceding the filing of his caveat, and has made oath of his intention to become a citizen.

The caveat must comprise a specification, oath, and, when the nature of the case admits of it, a drawing, and, like the application, must be limited to a single invention or improvement.

Fees.

Fees must be paid in advance, and are as follows: On filing each original application for a patent, $15. On issuing each original patent, $20. In design cases: For three years and six months, $10; for seven years, $15; for fourteen years, $30. On filing each caveat, $10. On every application for the reissue of a patent, $30. On filing each disclaimer, $10. For certified copies of patents and other papers, including certified printed copies, 10 cents per hundred words. For recording every assignment, agreement, power of attorney or other paper, of three hundred words or under, $1; of over three hundred and under one thousand words, $2; of over one thousand words, $3. For copies of drawings, the reasonable cost of making them.

Greatest Known Depth of the Ocean.

The greatest known depth of the ocean is midway between the islands of Tristan d'Acunha and the mouth of the Rio de la Plata. The bottom was here reached at a depth of 46,236 feet, or eight and three-fourths miles, exceeding by more than 13,000 feet the height of Mt. Hercules, the loftiest mountain in the world. The average depth of all the oceans is from 2,000 to 3,000 fathoms.

PRINCIPAL POINTS OF CONSTITUTIONAL LAW.

Congress must meet at least once a year.

One State cannot undo the acts of another.

Congress may admit as many new States as desired.

The Constitution guarantees every citizen a speedy trial by jury.

A State cannot exercise a power which is vested in Congress alone.

One State must respect the laws and legal decisions of another.

Congress cannot pass a law to punish a crime already committed.

U. S. Senators are chosen by the legislatures of the States by joint ballot.

Bills for revenue can originate only in the House of Representatives.

A person committing a felony in one State cannot find refuge in another.

The Constitution of the United States forbids excessive bail or cruel punishment.

Treaties with foreign countries are made by the President and ratified by the Senate.

In the U. S. Senate Rhode Island or Nevada has an equal voice with New York.

When Congress passes a bankruptcy law it annuls all the State laws on that subject.

Writing alone does not constitute treason against the United States. There must be an overt act.

Congress cannot lay any disabilities on the children of a person convicted of crime or misdemeanor.

The Territories each send a delegate to Congress, who has the right of debate, but not the right to vote.

The Vice-President, who ex-officio presides over the Senate, has no vote in that body except on a tie ballot.

An act of Congress cannot become a law over the President's veto except on a two-thirds vote of both houses.

An officer of the Government cannot accept title of nobility, order or honor without the permission of Congress.

Money lost in the mails cannot be recovered from the Government. Registering a letter does not insure its contents.

It is the House of Representatives that may impeach the President for any crime, and the Senate hears the accusation.

If the President holds a bill longer than ten days while Congress is still in session, it becomes a law without his signature.

Silver coin of denominations less than $1 is not a legal tender

for more than $5.00. Copper and nickel coin is not legal tender.

The term of a Congressman is two years, but a Congressman may be re-elected to as many successive terms as his constituents may wish.

Amendments to the Constitution require a two-thirds vote of each house of Congress and must be ratified by at least three-fourths of the States.

When the militia is called out in the service of the General Government, they pass out of the control of the various States under the command of the President.

The President of the United States must be 35 years of age; a U. S. Senator, 30; a Congressman, 25. The President must have been a resident of the United States fourteen years.

A grand jury is a secret tribunal, and may hear only one side of a case. It simply decides whether there is good reason to hold for trial. It consists of twenty-four men, twelve of whom may indict.

A naturalized citizen cannot become President or Vice-President of the United States. A male child born abroad of American parents has an equal chance to become President with one born on American soil.

CURIOUS BY-PRODUCTS FROM COAL.—The Pittsburgh Dispatch mentions some chemical developments from coal that are new. There are a good many products from coal that the majority of the people know nothing of. Their number will go into the thousands, and research into this particular branch of inorganic chemistry is bringing new and rich rewards to scientists each year. One of the hydrocarbons distinctly produced from coal tar is benzole. This is the base of magenta red and blue coloring matters and of the oil of bitter almonds. This oil formerly came entirely from the vegetable product from which it takes its name but now it is, to a large extent, made from benzole, and a chemically pure product is secured. The vegetable oil of bitter almonds contains a certain amount of prussic acid, which is a poisonous substance. Toluene, or tolulo, is another product from coal tar, which is the base of a great many chemicals. Benzoic acid, which used to be made almost entirely from plants, is now readily made from toluene. Carbolic acid is another product of tolulo. The latter is a colorless fluid with a smell very much like crude petroleum, while carbolic acid and salicylic acid, two of its products, are far from being sweet-smelling compounds. Yet this same tolulo is the basis of a number of very fragrant products. Wintergreen oil, much purer than from the plant, and generally preferred by confectioners and others who use it, is one; oil of cinnamon, cinnamic acid, and oil of cloves are among the middle products which are in great demand. As yet the products of coal tar have not been made use of for medicines to any great extent, except as disinfectants, but, from experiments now going on, it is hoped to produce pure quinine from chinolene, one of the coal-tar products, and scientists say that it is only a question of time when all alkaloids known, and probably others not now known, will be made from coal tar. It would take a good-sized book to even begin to give an idea of the commercial products alone of coal tar. Nearly every known color, except cochineal red and indigo blue, is made, and the latter was produced after nine years of experiment by the eminent German scientist Byer of Munich, but the manufacture was so expensive that it has never been done except for scientific purposes. The logwood and madder dyes of our grandmothers' days are rarely seen in the market now, owing to the cheapness with which they are manufactured. Red ink, which formerly was made almost exclusively from carmine, is now made from eosine, one of the numerous coal-tar progeny.

VOTING AND NATURALIZATION.

The right to vote comes from the State, and is a State gift. Naturalization is a Federal right, and is a gift of the Union, not of any one State. In nearly one-half the Union aliens who have declared intentions vote and have the right to vote equally with naturalized or native-born citizens. In the other half only actual citizens may vote. The Federal naturalization laws apply to the whole Union alike, and provide that no alien male may be naturalized until after five years' residence. Even after five years' residence and due naturalization he is not entitled to vote unless the laws of the State confer the privilege upon him, and he may vote in one State (Minnesota) four months after landing, if he has immediately declared his intention, under United States law, to become a citizen.

Naturalization.

The conditions under and the manner in which an alien may be admitted to become a citizen of the United States are prescribed by Sections 2165-74 of the Revised Statutes of the United States.

DECLARATION OF INTENTION.—The alien must declare upon oath before a Circuit or District Court of the United States, or a District or Supreme Court of the Territories, or a court of record of any of the States having common law jurisdiction, and a seal and clerk, two years at least prior to his admission, that it is, *bona fide*, his intention to become a citizen of the United States, and to renounce forever all allegiance and fidelity to any foreign prince or State, and particularly to the one of which he may be at the time a citizen or subject.

OATH ON APPLICATION FOR ADMISSION.—He must, at the time of his application to be admitted, declare on oath, before some one of the courts above specified, "that he will support the Constitution of the United States, and that he absolutely and entirely renounces and abjures all allegiance and fidelity to every foreign prince, potentate, State or sovereignty, and particularly, by name, to the prince, potentate, State or sovereignty of which he was before a citizen or subject," which proceedings must be recorded by the clerk of the court.

CONDITIONS FOR CITIZENSHIP.—If it shall appear to the satisfaction of the court to which the alien has applied that he has resided continuously within the United States for at least five years, and within the State or Territory where such court is at the time held one year at least; and that during that time "he has behaved as a man of good moral character, attached to the principles of the Constitution of the United States, and well disposed to the good order and happiness of the same," he will be admitted to citizenship.

TITLES OF NOBILITY.—If the applicant has borne any hereditary title or order of nobility, he must make an express renunciation of the same at the time of his application.

SOLDIERS.—Any alien of the age of twenty-one years and upwards, who has been in the armies of the United States and has been honorably discharged therefrom, may become a citizen on his petition, without any previous declaration of intention, provided that he has resided in the United States at least one year previous to his application, and is of good moral character.

MINORS.—Any alien under the age of twenty-one years who has resided in the United States three years next preceding his arriving at that age, and who has continued to reside therein to the time he may make application to be admitted a citizen thereof, may, after he arrives at the age of twenty-one years, and after he has resided five years within the United States, including the three years of his minority, be admitted a citizen; but he must make a declaration on oath and prove

to the satisfaction of the court that for two years next preceding it has been his *bona fide* intention to become a citizen.

CHILDREN OF NATURALIZED CITIZENS.—The children of persons who have been duly naturalized, being under the age of sixteen years at the time of the naturalization of their parents, shall, if dwelling in the United States, be considered as citizens thereof.

CITIZENS' CHILDREN WHO ARE BORN ABROAD.—The children of persons who now are or have been citizens of the United States are, though born out of the limits and jurisdiction of the United States, considered as citizens thereof.

PROTECTION ABROAD TO NATURALIZED CITIZENS.—Section 2000 of the Revised Statutes of the United States declares that "all naturalized citizens of the United States while in foreign countries are entitled to and shall receive from this Government the same protection of persons and property which is accorded to native-born citizens."

When a Man Becomes of Age.

The question sometimes arises whether a man is entitled to vote at an election held on the day preceding the twenty-first anniversary of his birth. Blackstone, in his Commentaries, book 1, page 463, says: "Full age in male or female is 21 years, which age is completed on the day preceding the anniversary of a person's birth, who, till that time, is an infant, and so styled in law." The late Chief Justice Sharswood, in his edition of Blackstone's Commentaries, quotes Christian's note on the above as follows: "If he is born on the 16th day of February, 1608, he is of age to do any legal act on the morning of the 15th of February, 1629, though he may not have lived twenty-one years by nearly forty-eight hours. The reason assigned is that in law there is no fraction of a day; and if the birth were on the last second of one day and the act on the first second of the preceding day twenty-one years after, then twenty-one years would be complete; and in the law it is the same whether a thing is done upon one moment of the day or another." The same high authority (Sharswood) adds in a note of his own: "A person is of full age the day before the twenty-first anniversary of his birthday."

THE PRESIDENTIAL ELECTION.

The President and Vice-President of the United States are chosen by officials termed "Electors" in each State, who are, under existing State laws, chosen by the qualified voters thereof by ballot, on the first Tuesday after the first Monday in November in every fourth year preceding the year in which the Presidential term expires.

The Constitution of the United States prescribes that each State shall "appoint," in such manner as the Legislature thereof may direct, a number of electors equal to the whole number of

Senators and Representatives to which the State may be entitled in Congress; but no Senator or Representative or person holding an office of trust or profit under the United States shall be an elector. The Constitution requires that the day when electors are chosen shall be the same throughout the United States. At the beginning of our Government most of the electors were chosen by the Legislatures of their respective States, the people having no direct participation in their choice; and one State, South Carolina, continued that practice down to the breaking out of the Civil War. But in all the States now the Presidential electors are, under the direction of State laws, chosen by the people.

The manner in which the chosen electors meet and ballot for a President and Vice-President of the United States is provided for in Article XII. of the Constitution. The same article prescribes the mode in which the Congress shall count the ballots of the electors, and announce the result.

The procedure of the two houses, in case the returns of the election of electors from any State are disputed, is provided in the "Electoral Count" Act, passed by the Forty-ninth Congress.

The Constitution defines who is eligible for President of the United States, as follows:

No person except a natural-born citizen or a citizen of the United States at the time of the adoption of this Constitution shall be eligible to the office of President; neither shall any person be eligible to that office who shall not have attained to the age of 35 years.

The qualifications for Vice-President are the same.

The "Electoral Count" Act directs that the Presidential electors shall meet and give their votes on the second Monday in January next following their election. It fixes the time when Congress shall be in session to count the ballots as the second Wednesday in February succeeding the meeting of the electors.

The Presidential succession is fixed by chapter 4 of the acts of the Forty-ninth Congress, first session. In case of the removal, death, resignation or inability of both the President and Vice-President, then the Secretary of State shall act as President until the disability of the President or Vice-President is removed or a President is elected. If there be no Secretary of State, then the Secretary of the Treasury will act; and the remainder of the order of succession is: The Secretary of War, Attorney-General, Postmaster-General, Secretary of the Navy, and Secretary of the Interior. The acting President must, upon taking office, convene Congress, if not at the time in session, in extraordinary session, giving twenty days' notice.

Qualifications of Voters in the States.

States.	Requirement as to Citizenship.	Residence in			Registration.
		State	Co'ty	Precinct.	
Alabama...	Citizen or declared intent..	1 y	3 m	1 m	Legis. may regulate
Arkansas...	Citizen or declared intent..	1 y	6 m	1 m	Prohib. as bar to suf
California..	Actual citizens..... ..	1 y	90 d	30 d	Required by law
Colorado....	Citizen or declared intent..	6 m	....	....	Req. by constitution
Connecticut.	Actual citizens.....	1 y	6 m	6 m	Required by law
Delaware...	Actual county taxpayers...	1 y	1 m	....	No reg. required
Florida	U. S. citizens or declared intention.....	1 y	6 m	....	Req. by constitutio
Georgia	Actual citizens.....	1 y	6 m	....	Legis. may regulate
Illinois.....	Actual citizens	1 y	90 d	30 d	Required by law
Indiana... .	Citizen or declared intent..	6 m	60 d	30 d	No law for reg
Iowa.....	Actual citizens.....	6 m	60 d	....	Required by law
Kansas.....	Citizen or declared intent..	6 m	....	30 d	Req. in cities only
Kentucky ..	Citizen or declared intent. .	2 y	1 y	60 d	No reg. required
Louisiana...	Citizen or declared intent..	1 y	6 m	30 d	Legis may regulate
Maine	Actual citizens.....	3 m	....	....	Required by law
Maryland. .	Actual citizens.....	1 y	6 m	...	Req. by constitution
Massach' tts	Citizens.....	1 y	....	6 m	Required by law
Michigan...	Citizen or declared intent..	3 m	....	10 d	Required by law
Minnesota..	Citizen or declared intent..	4 m	....	10 d	Required by law
Mississippi..	Actual citizens....	6 m	1 m	...	Req. by constitution
Missouri....	Citizen or declared intent..	1 y	60 d	....	Req by constitution in cities only
Nebraska . .	Citizen or declared intent..	6 m	....	....	Required by law
Nevada	Citizen or declared intent..	6 m	30 d	....	Req. by constitution
N. Ham'sh'e	Actual citizens.....	....	....	6 m	Required by law
New Jersey.	Actual citizens.....	1 y	5 m	....	Req. cities of 10,000
New York..	Actual citizens.....	1 y	4 m	30 d	Req. cities of 10,000
N. Carolina.	Actual citizens.....	1 y	90 d	....	Req. by constitution
Ohio	Actual citizens.....	1 y	....	....	No reg. required
Oregon... .	Citizen or declared intent..	6 m	....	....	.....
Pennsylv'n'a	Actual citizens..	1 y	....	2 m	Req. by constitution
R. Island...	Actual tax-paying citizens..	1 y	....	6 m	Required by law
S. Carolina.	Actual citizens.....	1 y	60 d	....	Req. by constitution
Tennessee..	Actual citizens.....	1 y	6 m	....	No reg. required
Texas	Citizen or declared intent..	1 y	6 m	6 m	Prohibited
Vermont . . .	Actual citizens.....	1 y	....	....	Required by law
Virginia.. ..	Actual citizens.....	1 y	....	3 m	Required by law
W. Virginia.	Actual citizens.....	1 y	60 d	....	Prohibited
Wisconsin...	Citizen or declared intent..	1 y	....	....	Required by law

State elections are held in the various States as follows: Alabama and Kentucky, first Monday in August; Arkansas, first Monday in September; Georgia, first Wednesday in October; Louisiana, Tuesday after third Monday in April; Maine, second Monday in September; Oregon, first Monday in June; Rhode Island, first Wednesday in April; Vermont, first Tuesday in September. All others are on Tuesday after first Monday in November. State Presidential elections are all on Tuesday after first Monday in November.

Roderigo de Triana was the name of the sailor with Columbus who first saw the "New World"—at 2 A. M., Oct. 12, 1492, on board the Pinta.

THE AUSTRALIAN BALLOT SYSTEM.

What is termed the Australian Ballot System, the professed purposes of which are to secure the secrecy of the ballot and prevent the intimidation or corrupting of the voter, was practically introduced into the United States recently by its adoption by law in the State of Massachusetts and the city of Louisville, Ky. Agitation for the adoption of this plan of voting is now rife in many States.

Its substantial requirements are as follows: Ballots are to be provided at public expense; none but these ballots are to be used; on them are to be printed the names of all candidates who are nominated either by conventions or petitions a short period prior to the election; the ballots are to be distributed only by sworn ballot clerks, at the polls, to voters, and for actual and immediate use in voting; the voter is allowed five minutes in which to retire into a booth conveniently arranged, where he secretly marks his choice of candidates upon the face of the ballot, or, if he prefers, writes the names of candidates of his own nomination in place of those whose names are already printed; having done this he proceeds directly to the ballot-box, and, without exposing the face of the ballot, or communicating with any one, deposits the ballot as his vote. For the benefit of the blind and illiterate, such a voter is permitted to select one of the two ballot clerks, who, under oath of fidelity and secrecy, assists him to mark his ballot.

POPULAR VOTE.

For Presidential candidates from 1824 to and including 1888. Prior to 1824 electors were chosen by the Legislatures of the different States.

1824—J. Q. Adams had 105,321 to 155,872 for Jackson, 44,282 for Crawford, and 46,587 for Clay. Jackson over Adams, 50,551. Adams less than combined vote of others, 140,869. Of the whole vote Adams had 29.92 per cent., Jackson 44.27. Clay 13.23, Crawford 13.23. Adams elected by House of Representatives.

1828—Jackson had 647,231 to 509,097 for J. Q. Adams. Jackson's majority, 138,134. Of the whole vote Jackson had 55.97 per cent., Adams 44.03.

1832—Jackson had 687,502 to 530,189 for Clay, and 33,108 for Floyd and Wirt combined. Jackson's majority. 124,205. Of the whole vote Jackson had 54.96 per cent., Clay 42.39, and the others combined 2.65.

1836—Van Buren had 761,549 to 736,656, the combined vote for Harrison. White, Webster and Maguin. Van Buren's majority, 24,893. Of the whole vote Van Buren had 50.83 per cent., and the others combined 49.17.

1840—Harrison had 1,275,017 to 1,128,702 for Van Buren, and 7,059 for Birney. Harrison's majority, 139,256. Of the whole vote Harrison had 52.89 per cent., Van Buren 46 82 and Birney .29.

1844—Polk had 1,337,243 to 1,299,068 for Clay and 62,300 for Birney. Polk over Clay, 38,175. Polk less than others combined, 24,125. Of the whole vote Polk had 49.55 per cent., Clay 48.14 and Birney 2.21.

1848—Taylor had 1,360,101 to 1 220,544 for Cass, and 291,263 for Van Buren. Taylor over Cass, 139,577. Taylor less than others combined, 151,706. Of the whole vote Taylor had 47.36 per

Popular Vote.—*Concluded.*

cent., Cass 42.50 and Van Buren 10.14.

1852—Pierce had 1,601,474 to 1,386,578 for Scott and 156,149 for Hale. Pierce over all, 58,747. Of the whole vote Pierce had 50.90 per cent., Scott 44.10 and Hale 4 97.

1856—Buchanan had 1,838,169 to 1,341,-264 for Fremont and 874,534 for Fillmore. Buchanan over Fremont, 496,-905. Buchanan less than combined vote of others, 377,629. Of the whole vote Buchanan had 45.34 per cent., Fremont 33.09 and Fillmore 21.57.

1860—Lincoln had 1,866,352 to 1,375,-157 for Douglas, 845,763 for Breckenridge and 589,581 for Bell. Lincoln over Breckenridge, 491,195. Lincoln less than Douglas and Breckenridge combined, 354,568. Lincoln lessthan combined vote of all others, 944,149. Of the whole vote Lincoln had 39.91 per cent., Douglas 29 40, Breckenridge 18.08 and Bell 12 61.

1864—Lincoln had 2,216,067 to 1,808,-725 for McClellan (eleven States not voting, viz: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia). Lincoln's majority, 408,342. Of the whole vote Lincoln had 55.06 per cent. and McClellan 44.94.

1868—Grant had 3,015 071 to 2,709,613 for Seymour (three States not voting, viz: Mississippi, Texas and Virginia). Grant's majority, 305,458. Of the whole vote Grant had 52.67 per cent. and Seymour 47.33.

1872—Grant had 3,597,070 to 2,834,079 for Greeley, 29,408 for O'Conor and 5,608 for Black. Grant's majority, 729,975. Of the whole vote Grant had 55.63 per cent., Greeley 43.83, O'Conor .15, Black .09.

1876—Hayes had 4,033,950 to 4,284,885 for Tilden, 81,740 for Cooper, 9,522 for Smith and 2,636 scattering. Tilden's majority over Hayes, 250,935. Tilden's majority of the entire vote cast, 157,037. Hayes less than the combined vote of others, 344,833. Of the whole vote cast Hayes had 47.95 per cent., Tilden 50.94, Cooper .97, Smith .11, scattering .03.

1880—Garfield had 4,449,053 to 4,442,-035 for Hancock, 307,306 for Weaver and 12,576 scattering. Garfield over Hancock, 7,018. Garfield less than the combined vote of others, 313,864. Of the popular vote Garfield had 48.26 per cent., Hancock 48.25, Weaver 3.33, scattering 13.

1884—Cleveland had 4,874,986 to 4,851,-981 for Blaine, 150,369 for St. John, 173,370 for Butler. Cleveland had over Blaine 23,006. Cleveland had 48.48 per cent., Blaine 48.22, St. John 1.49, Butler 1.74.

1888—Harrison had 5,441,902 to 5,538,-560 for Cleveland, 249,937 for Fisk, 147,521 for Streeter, 3,673 for Cowdrey, 1,591 for Curtis and 9,845 scattering.

1892—Cleveland had 5,556,562 to 5,162,-874 for Harrison, 1,055,424 for Weaver (People's), and 264,066 for Bidwell (Prohibition).

Of the Presidents, Adams, Federalist; Polk Buchanan and Cleveland, Democrats; Taylor, Whig; Lincoln, Hayes, Garfield and Harrison, Republicans, did not, when elected, receive a majority of the popular vote. The highest percentage of popular vote received by any President was 55.97 for Jackson, Democrat, in 1828, and the lowest 39.91 for Lincoln, Republican, in 1860; Harrison, Republican, next lowest, with 47.83 Hayes and Harrison, with the exception of John Quincy Adams, who was chosen by the House of Representatives, were the only Presidents ever elected who did not have a majority over their principal competitors, and Tilden and Cleveland the only defeated candidates who had a majority over the President-elect.

CANDLE-POWER.—The candle-power of a light may be approximately calculated by comparing the shadow cast by a rod in the light of a standard candle, with the shadow cast by the light to be tested. By moving the latter toward or away from the rod, a point will be reached at which the shadow cast by both lights will be of the same intensity. The intensities of the two lights are directly proportional to the squares of their distances from the shadows; for example, suppose the light to be tested is three times the distance of the candle its illuminating power is nine times as great.

THE CIVIL SERVICE.

The officials and clerks—over 120,000 in all—by whom the people's business in the administration of government is carried on, constitute the Civil Service. About 5,000 of these are appointed by the President, alone or with the consent of the Senate; about 15,000 under what are known as the "Civil Service Rules," but the great body of officeholders are appointed by heads of departments.

Those employed in the civil service have always been theoretically entitled to serve "during good behavior," but practically, until within a few years, their positions have depended upon their allegiance to the political party in power.

In 1883 Congress passed a law for the improvement of the civil service of the United States. This act provides for the appointment by the President of three commissioners to have general charge of filling the vacancies in the civil service department, and stipulates that the fitness of all applicants for all subordinate positions in the departments at Washington, and in all custom-houses and postoffices having as many as 50 officeholders, shall be tested by examinations, and the positions assigned with reference to the capacity, education and character of the applicants, regardless of political preferences.

According to this, no absolute appointment to office can be made until the applicant has proven his or her ability to fill the position satisfactorily by six months' service; no person habitually using intoxicating beverages to excess shall be appointed to, or retained in, any office; no recommendation which may be given by any Senator or member of the House of Representatives, except as to character and residence, shall be considered by the examiners; men and women shall receive the same pay for the same work.

The general competitive examinations for admission to the service are limited to the following subjects: 1. Orthography, penmanship and copying. 2. Arithmetic—fundamental rules, fractions and percentage. 3. Interest, discount, and the elements of bookkeeping and of accounts. 4. Elements of the English language, letter writing, and the proper construction of sentences. 5. Elements of the geography, history and government of the U. S.

A standing of 65 per cent. in the first three branches is necessary to qualify an applicant for appointment. Where special qualifications are necessary for specific work the examinations are adapted to test the knowledge of the applicant in that particular line.

No applicant will be examined who cannot furnish proof that he is of good moral character and in good health.

There is a board of examiners in each of the principal cities of

the U. S., and several examinations are held each year. Applications must be made on the regular "application paper," which can be obtained of the commissioners, or any board of examiners.

Several of the States have adopted the principles laid down in the civil service act and applied them to the State civil service, and it is probably only a question of time when Civil Service Reform will be consummated throughout the U. S., and the public service will thereby be rendered much more efficient.

United States Land Measure and Homestead Law.

A township is 36 sections, each a mile square. A section is 640 acres. A quarter section, half a mile square, is 160 acres. An eighth section, half a mile long, north and south, and a quarter of a mile wide, is 80 acres. A sixteenth section, a quarter of a mile square, is 40 acres.

6	5	4	3	2	NW NE / SW SE
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

The sections are all numbered 1 to 36, commencing at north-east corner, thus:

The sections are all divided in quarters, which are named by the cardinal points, as in section 1. The quarters are divided in the same way, as shown in the smaller diagram. The description of a forty-acre lot would read: The south half of the west half of the south-west quarter of section 1 in township 24, north of range 7 west, or as the case might be; and sometimes will fall short and sometimes overrun the number of acres it is supposed to contain.

NW NW	NE NW	NW NE	NE NE
SW NW	SE NW	SW NE	SE NE
NW SW	NE SW	NW SE	NE SE
SW SW	SE SW	SW SE	SE SE

Titles to the Public Lands—How Acquired.

The public lands of the United States still unsold and open to settlement are divided into two classes, one class being sold by the Government for $1.25 per acre as the minimum price, the other at $2.50 per acre, being the alternate sections reserved by the United States in land grants to railroads, etc. Such tracts are sold upon application to the Land Register. Heads of

families, or citizens over twenty-one years, who may settle upon any quarter section (or 160 acres) have the right under the pre-emption law of prior claim to purchase, on complying with the regulations.

Under the homestead laws, any citizen, or intending citizen, has the right to 160 acres of the $1.25 land, or 80 acres of the $2.50 land, after an actual settlement and cultivation of the same for five years. Under the timber culture law, any settler who has cultivated for two years as much as five acres in trees of an 80-acre homestead, or ten acres of a homestead of 160 acres, is entitled to a free patent for the land at the end of eight years.

STAGE FAVORITES.

The following is a carefully prepared list of stage favorites, giving the professional and private name of each: Fanny Davenport, Mrs. McDowell; Louise Pomeroy, Mrs. Arthur Elliott; Maggie Mitchell, Mrs. Henry Paddock; Rose Eytinge, Mrs. Cyril Searle; Rose Coghlan, Mrs. E. H. Edgerly; Margaret Mather, Margaret Miles; Kate Claxton, Mrs. Charles Stevenson; Effie Ellsler, Mrs. Frank Weston; Lillian Russell, Mrs. Edward Solomon; Agnes Booth, Mrs. John B. Schoeffel; Ida Mulle, Mrs. Benjamin Tuthill; Kate Castleton, Mrs. Harry Phillips; Lotta, Miss Charlotte Crabtree; Alice Atherton, Mrs. Willie Edouin; Minnie Maddern, Mrs. Le Grand White; Irene Perry, Mrs. Albert Weber; Minnie Palmer, Mrs. John R. Rogers; Marie Wainright, Mrs. Louis James; Marie Jansen, Mrs. James Barton; Laura Joyce, Mrs. Digby Bell; Minnie Conway, Mrs. Osmund Tearle; Dickie Lingard, Mrs. David Dalziell; Kittie Blanchard, Mrs. McKee Rankin; Louise Davenport, Mrs. W. E. Sheridan; Louise Thorndyke, Mrs. D. Boucicault; Agnes Robertson, Mrs. D. Boucicault; Maude Granger, Mrs. Albert Follin; Marie Prescott, Mrs. —— Perzel; Caroline Hill, Mrs. Herbert Kelcey; Minnie Hauk, Mrs. G. Von Hesse Wartegg; Lily West, Mrs. Harry Brown; Ellie Wilton, Mrs. Frank Wilton; Helen Dauvray, Mrs. J. M. Ward; Fay Templeton, Mrs. Howell; Modjeska, Mme. Helena Benda; Janauschek, Mrs. E. J. Pillott; Emma Abbott, Mrs. Eugene Wetherell; Marian Elmore, Mrs. Frank Losee; Ada Gray, Mrs. Charles Watkins; Lottie Church, Mrs. John A. Stevens; Sydney Cowell, Mrs. Geo. Giddens; Annie Pixley, Mrs. Robert Fulford; Clara Morris, Mrs. F. C. Harriott; Julia Wilson, Mrs. Charles Fox; Dora Wiley, Mrs. Richard Golden; Lizzie May Ulmer, Mrs. George Ulmer; Mattie Vickers, Mrs. Charles Rogers; Theresa Vaughn, Mrs. William Mestayer; Albina de Mer, Mrs. M. B. Curtis; Alfa Norman, Mrs. Charles Byrne; Lizzie Harold, Mrs. W. S. Cornlay.

POINTS OF CRIMINAL LAW.

You cannot lawfully condone an offense by receiving back stolen property.

The exemption of females from arrest applies only in civil, not in criminal matters.

Every man is bound to obey the call of a Sheriff for assistance in making an arrest.

The rule "Every man's house is his castle" does not hold good when a man is accused of crime.

Embezzlement can be charged only against a clerk or servant, or the officer or agent of a corporation.

Bigamy cannot be proven in law if one party to a marriage has been absent and not heard from for five years.

Grand larceny is when the value of property stolen exceeds $25.00—when less than that, the offense is petit larceny.

Arson to be in the first degree must have been committed at night and the buildings fired must have been inhabited.

Drunkenness is not a legal excuse for crime, but delirium tremens is considered by the law as a species of insanity.

In a case of assault it is only necessary to prove an "offer or attempt at assault." Battery presumes physical violence.

Mayhem, although popularly supposed to refer to injury to the face, lip, tongue, eye, or ear, applies to any injury done a limb.

A felony is a crime punishable by imprisonment in a State prison; an "infamous" crime is one punishable with death or State prison.

A police officer is not authorized to make an arrest without a warrant unless he has personal knowledge of the offense for which the arrest is made.

An accident is not a crime, unless criminal carelessness can be proven. A man shooting at a burglar and killing a member of his family is not a murderer.

Burglary in the first degree can be committed only in the night time. Twilight, if dark enough to prevent distinguishing a man's face, is the same as "night" in law.

Murder to be in the first degree must be willful, premeditated and malicious, or committed while the murderer is engaged in a felonious act. The killing of a man in a duel is murder, and it is a misdemeanor to accept or give a challenge.

False swearing is perjury in law only when willfully done, and when the oath has been legally administered. Such qualifying expressions as "to the best of my belief," "as I am informed," may save an averment from being perjured. The law is that the false statement sworn to must be absolute. Subornation of perjury is a felony.

THE TARIFF.

CUSTOMS AVERAGES AND TARIFF LEGISLATION FOR 100 YEARS.

The first Tariff Act was signed by President Washington on July 4, 1789. The new Government had just been established, and the object of the law was to put money into the empty Treasury of the Republic. Alexander Hamilton was the author of the measure, which was modeled on the 5 per cent. import duty that the Congress of the Confederation had tried in vain to impose. This first law imposed specific duties on forty-seven articles and ad valorem rates of 7½, 10, 12½ and 15 per cent. on four commodities or small groups. The unenumerated goods were compelled to pay 5 per cent. The second Tariff Act passed the House by a vote of 39 to 13, and passed the Senate without a division. It was approved by the President on August 10, 1790. This Act was longer than its predecessor and the scale of duties was higher. Then followed the Act of May 2, 1792, which became operative in the following July. It raised the duty on unenumerated merchandise to 7½ per cent. and that on many articles paying 7½ to 10 per cent. Another Tariff bill was passed on June 7, 1794, going into effect on July 1. It imposed numerous rates in addition to those already payable, some of them specific and others 2½ and 5 per cent. ad valorem. Additional tariff measures were enacted on March 3 and July 8, 1797, and on May 13, 1800. These Acts imposed additional rates, and there was a further increase of 2½ per cent. on March 26, 1804, on all imports then paying ad valorem rates.

The whole industrial situation of the country was changed suddenly and radically in 1807-8. Napoleon's Berlin and Milan decrees were followed by the English Orders in Council, and Mr. Jefferson's administration retaliated for the outrages on our commerce by the celebrated Embargo in December, 1807. This was followed by the Non-Intercourse Act in 1809, and by a declaration of war against England in 1812. During the progress of hostilities all commercial intercourse with Great Britain was, of course, suspended, and all import duties were doubled as a war measure.

This is known as the "Tariff of 1812." It passed the House of Representatives by a vote of 76 to 48, and received the sanction of the Senate by 20 votes in its favor to 9 against it. Amendments to it were adopted on February 25, and again on July 29, 1813. On February 15, 1816, the additional duties imposed by the Act of 1812 were repealed, and additional duties of 42 per cent., to take effect on July 1, were substituted, but the law did not go into operation. From 1812 to 1816 the average rate on all imports was 32.73 per cent., the range being from 6.84 per cent. in 1815 to 69.03 in 1813.

THE LOWNDES-CALHOUN BILL.

The next great Tariff measure is known as the Lowndes-Calhoun bill. It was approved April 27, 1816, took effect the following July, and may be said to be the first of the protective tariffs. It was not wholly set aside until 1842, under the administration of Mr. Polk. The ad valorem duties under it ranged from 7½ to 33 per cent. The unenumerated goods paid 15 per cent., the manufacturers of iron and other metals generally 15 per cent., the majority

of woolen goods 25 per cent., cotton goods 25 per cent., "with clauses establishing 'minimums'"—that is, in reckoning duties, 25 cents per square yard was to be deemed the minimum cost of cotton cloth; unbleached and uncolored yarn, 60 cents, and bleached or colored yarn, 75 cents per pound. These rates became practically prohibitory on the cheaper goods. The law was amended April 20, 1818, and again on March 3, 1819. It had the support of New England and the Middle States, but the South was opposed to it. From 1817 to 1820 the average rate on imports was 26.52 per cent.; from 1821 to 1824, 35.02 per cent.; and from 1821 to 1824, on dutiable goods only, 36.88 per cent. This general increase of duties was due to the necessity of providing for the interest on the heavy debt incurred by the second war with England.

The Clay Tariff followed in 1824. The vote in the House was close—107 to 102; and there was a majority of only 4 in the Senate. New England and the South voted against the measure, while on the other side were ranged the West and Middle States. It received the President's signature on May 22, 1824, and went into effect July 1. It remained in force in almost its entirety until 1842. It raised the duty on woolen goods from 25 to 30 per cent. for one year, and then to 33⅓ per cent. There was a "minimum" of 30 cents per square yard on cotton cloth. Wool over 10 cents a pound was rated at 20 per cent. until June 1, 1825, then 25 per cent. for one year, and then 30 per cent. The average rate on all imports from 1825 to 1828 was 47.17 per cent. and on dutiable goods 50.29 per cent.

THE "TARIFF OF ABOMINATIONS."

The "Tariff of Abominations," as it is called, was approved May 19, 1828, and went into operation part the following July and part in September. In the House 105 members voted for it and 94 members, mostly from New England and the South, against it. In the Senate the vote was 26 to 21. It had special reference to iron, wool and manufactures of wool. The duty on wool was four cents per pound and 40 per cent. for one year; then four cents and 45 per cent. for a year; then four cents and 50 per cent. Somewhat lower duties were provided for in an Act passed on May 24, 1828, again in May, 1830, and still again on July 13, 1832. The average duty on all goods from 1829 to 1832 was 47.81 per cent. and on all dutiable articles 51.55 per cent.

The Modifying Tariff of 1832 was intended "to correct the inequalities of that of 1828." It was passed by the Whigs, or National Republicans, and levied high duties on cotton and woolen goods and other articles to which protection was meant to be applied. The vote in the House was 132 to 65 and in the Senate 32 to 16, the votes in favor of it coming from all sections of the country. The New England vote in the House was a tie. It was approved on July 14, and took effect on March 3, 1833. The existing duties were superseded by the Act, some of them reduced and a few raised. In a separate Act of the same date railroad iron was made free. Under its operation the average rate on imports in 1832–33, during the ten months it was in force, was 28.99 per cent. and dutiable articles 38.25 per cent.

The Compromise Tariff of 1833 provided for taking off one-third of the duties each year until a uniform rate on all of 20 per cent. should be reached. It passed the House by 119 to 85 and the Senate by 29 to 16. New England then joined the Middle States in voting for high protective duties. It was approved on March 2, 1833, the day before the Tariff of 1832 went into operation, and took effect on January 1, 1834. The terms of the compromise were that all duties which in the Tariff of 1832 exceeded 20 per cent. should have one-tenth of the excess over 20 per cent. taken off on January 1, 1834; one-tenth more on January 1, 1836; again one-tenth in 1838, and another one-tenth in 1840; so that by 1840 four-tenths of the excess over 20 per cent. would be disposed of. Then on January 1, 1842, one-half of this remaining excess was to be taken off, and on July 1, 1842, the other half of the remaining excess was to go. There would, therefore, after July 1, 1842, have been a uniform rate of 20 per cent. on all articles. The average duty on all imports from 1834 to 1842 was 19.25 per cent. and on dutiable articles 34.73 per cent.

THE TARIFF OF 1842.

The Tariff of 1842 was passed by the Whigs as a party measure, and was avowedly protective. It took effect on August 30, 1842, changed all existing rates, was amended in March, 1843, and died December 1, 1846. New England and the Middle States gave it strong support. The South was earnest in opposition and the West was a tie. The average rate on all imports under it was 26.92 per cent. and on dutiable articles 33.47 per cent.

The Polk-Walker Tariff of 1846 is one of the most noteworthy acts in the fiscal history of our government.

Robert J. Walker, of Mississippi, who was President Polk's Secretary of the Treasury, laid down these principles as a basis for revenue reform in his celebrated report of 1845:

"No more money shall be collected than is needed for economical administration.

"The duty on no article should exceed the lowest rate which will yield the largest revenue.

"Below such rate discrimination may be made, or for imperative reasons an article may be made free.

"Luxuries should be taxed at the minimum rate for revenue.

"Duties should be all ad valorem, and never specific.

"Duties should be so imposed as to operate as equally as possible throughout the Union, without respect to class or section."

The bill framed on this basis was approved by Mr. Polk on July 30, 1846. It passed the House by 114 to 95, the East being in opposition and the West and South in support. The vote in the Senate on a third reading was a tie, and Vice-President Dallas gave the casting vote in the affirmative. The Senate on the final passage stood 28 to 27. This Act superseded the Whig tariff, and remained in force until 1861. It swept away specific and compound duties. It divided all dutiable merchandise into eight classes, which introduced greater simplicity into the whole system of customs regulations. The average duty on all imports was, from 1847 to 1857, 23.20 per cent. and on dutiable articles 26.22 per cent.

The Tariff of 1857, which was the next in order, made a still further reduction in duties. It was approved on March 3, 1857, took effect on July 1, and remained in force until April 1, 1861. New England united with the South in giving it 123 votes to 72 in the House, and in the Senate 33 to 12. The average duty on all goods, from 1858 to 1861, was 15.66 per cent. and on dutiable articles 20.12 per cent.

THE MORRILL TARIFF.

The Morrill Tariff of 1861 differed from all its predecessors in that it provided for a general system of compound and differential duties, specific and ad valorem, and also made a distinction between goods imported from different parts of the world. It passed the House on May 11, 1860, by a vote of 105 to 64, and the Senate on February 20, 1861, by a vote of 25 to 14. From the first, through all the cumbrous legislation that has followed in its wake, it has been avowedly protective. It was frequently changed during the War of the Rebellion, ostensibly for purposes of revenue. At an early period in its history the number of rates ran up to over two thousand. From 1861 to 1869 every year produced some enlargement of the original scheme. In 1870 there was some modification of rates, generally in the line of reduction. Tea and coffee, taxed since 1861, were then put on the free list, and the duties on cotton and woolen goods, wool, iron, paper, glass and leather were lowered about 10 per cent. The free list was somewhat enlarged, but the reduction was rescinded in the Act of March 3, 1875. The duty on quinine was abolished on July 1, 1879. The average duty on all imports, from 1862 to 1883, was 34.16 per cent. and on dutiable articles 42.74 per cent.

The Commission Tariff was passed by the House on March 3, 1883, by a

vote of 152 to 116, and passed the Senate on March 2, the vote being 32 to 31. This was the tariff which was in force until October 6, 1890, when it was superseded, except as to tobacco and tin-plate, by the operation of the McKinley bill.

Under it the average had been put by Senator Carlisle at 45½ per cent., while Senator Aldrich insisted that the average was 45.13 per cent. As to the average rate under the Tariff of 1890, or McKinley Tariff, Senators Aldrich and Carlisle again differed, the former estimating it at about 41 per cent., while Mr. Carlisle computed it at 60 per cent.—the highest in the history of the Government. It passed the House by a vote of 152 to 81, and the Senate by a vote of 33 to 27.

BOVINES VS. EQUINES.—The differences anatomically and physiologically between the cattle tribe (Bos) and the horse family (Equus) is an interesting study. In parallel tables these can be seen at a glance. They have been condensed with a view of bringing the whole matter into a nutshell, so they may be understood at a glance:

CATTLE—	HORSES—
Have two toes	Have one toe.
Horned	Without horns.
Have no mane	Have flowing mane.
Long hair in a tuft at end of tail	Tail covered with long hair.
Pawing with fore-feet denotes anger	Pawing with fore-feet denotes hunger.
Seize forage with the tongue	Gather food with the lips.
Lips slightly movable	Lips very movable.
Have no upper incisor teeth	Have upper and lower incisors.
Lie down fore parts first	Lie down hind parts first.
Rise on hind-legs first	Rise on fore-legs first.
Four stomachs	One stomach.
They chew the cud	Do not chew the cud.
Have gall bladder	Have no gall bladder.
Mouth generally open when wearied	Mouth never open from exhaustion.
Defense by goring	Defense by kicking.
Bellow or moo	Neigh or whinny.
Do not sweat	Perspire easily.
Have dewlap	Have no dewlap.
No warts on inside of hind-legs	Hard, oval warts inside hind-legs.
Never use teeth in fighting	Use the teeth in fighting.
Do not retract the ears	Retract the ears when angry.
Very rough tongue	Soft, smooth tongue.
Short, broad head	Long, narrow head.
Wide, drooping ears	Erect, narrow ears.
Limbs formed for strength	Limbs formed for speed.
Do not roll in the dust	Do roll in the dust.
Sleep with both ears alike	Sleep with one ear forward.
Lie down to sleep	Often sleep standing.
Eat and lie down to ruminate	Never ruminate. Eat little and often.
Shoulders straight	Shoulders sloping.

MONARCHS AND THEIR END.—The world has had 2,550 kings or emperors of whom records are known, and who have reigned over seventy-four peoples. Of these rulers, 300 were overthrown, sixty-four were forced to abdicate, twenty-eight committed suicide, twenty-three became mad or imbecile, 100 were killed in battle, 123 were captured by the enemy, twenty-five were tortured to death, 151 were assassinated, and 108 were executed.

STOCK INVESTMENTS EXPLAINED.

THE CAPITAL of corporations is always divided into shares, usually of $100 each. These are known as *stock*, and represent an interest in the property and profits of the company. A *dividend* is the distribution of the profits, proportionate to number of shares held among the stockholders. *Stock certificates* are written instruments, signed by the proper officers of the company, and certifying that the holder is the owner of a certain number of shares. These are transferable, and may be bought and sold the same as other property. The sum for which each share or certificate was issued is the *par value*, and the amount for which it can be sold the *market* value.

PREFERRED STOCK takes preference of the ordinary stock of a corporation, and the holders are entitled to a stated per cent. annually out of net earnings before a dividend can be declared on common stock. Preferred stocks are generally the result of reorganization, although sometimes issued in payment of floating or unsecured debts.

WATERING STOCK.—Sometimes the charter of a corporation forbids the declaring of a dividend exceeding a certain per cent. of the par value of its stock. In this case the directors may find it desirable to "water" the stock—that is, issue additional shares. This increase in the number of shares of course reduces the percentage of dividend, although the same profit in the aggregate is secured to the stockholders.

Dealing in Stocks.

The person employing a broker to buy the stock is required to advance at the outset a certain per cent. of the purchase price of the stock, as security for possible losses by reason of a decline of the stock while in the broker's hands. The amount of the margin required is generally 10 per cent., but may be more or less, and frequently is nothing at all, depending on the broker's confidence in his customer's readiness to meet losses, if there be any.

The broker then goes into the stock exchange and buys of some selling broker the stock indicated, the buying broker himself advancing the purchase money.

The relation existing between the customer and the broker in a transaction of this kind may be briefly stated as follows:

The broker agrees: 1. That he will buy for his customer the stock indicated, at its market value. 2. That he will hold the stock for the benefit of his customer so long as the necessary margin is advanced, and kept paid, or until notice is given by either party that the transaction must be closed. 3. That he will at all times have the stock in his possession or under his control; or an equal amount of other shares of the same stock, sub-

ject to the call of the customer. 4. That he will sell the shares on the order of the customer, on payment to him of the purchase price advanced by the broker, accounting to the customer for the proceeds of the sale. 5. That he will exercise proper care and competent skill in the services which he undertakes to perform.

The customer agrees: 1. To pay the margin called for at the outset. 2. To keep good such margin according to the fluctuation of the market. 3. To take the stock purchased by his order when requested to do so by the broker, paying the latter the difference between the margin advanced and the sum paid for the stock by the broker, together with his commissions for doing the business.

Although the broker's money bought the stock, it belongs to the customer, together with all its earnings and dividends, while in the broker's possession, and the customer is entitled to the possession of the stock on payment to the broker of the sum of money to which he is entitled.

The broker may pledge the stock, or use it in his business, as collateral, but he must have it ready when called for by the customer, or other shares of the same stock equivalent in value.

The customer and the broker may make an express agreement that the broker may sell the stock without notice to the customer in the case of a threatened decline.

Generally speaking, when there are no directions as to selling, the broker will be protected if he can show that he followed the usual custom of brokers in like circumstances.

If the customer fails to advance the necessary margin when called for on reasonable notice, the broker may sell for his own protection.

The reasonable notice may be an hour, a day, or a week, depending on the condition of the market for that particular stock.

If a broker fraudulently converts the stock to his own use, he is guilty of embezzlement.

Bonds.

A *bond* is in the nature of a promissory note—the obligation of a corporation, state, county or city to pay a certain sum of money at a certain time, with interest payable at fixed periods or upon certain conditions.

The bond of a company may be a perfectly safe investment, when the stock is not; and the stock of a prosperous and successful company, paying large dividends or having a large surplus, may sell at a higher price than the bonds of the same company, the income from which is limited to the agreed rate of interest which they bear. A much closer scrutiny should be made

of a company's standing when one thinks of investing in its share capital, than when it is the intention to loan the company money on its mortgage bonds.

Generally the bonds of business corporations are secured by mortgage, but some classes of bonds are dependent on the solvency or good faith of the company issuing them.

The *coupons* attached to bonds represent the different installments of interest, and are to be cut off and collected from time to time as the interest becomes payable. Bonds are sometimes issued without coupons, and are then called *registered bonds.* Such bonds are payable only to the registered owner, and the interest on these is paid by check. *Convertible bonds* are such as contain provisions whereby they may be exchanged for stock, lands or other property.

Bonds are known as First Mortgage, Second Mortgage, etc., Debentures, Consols, Convertible Land Grant, Sinking Fund, Adjustment, Income or otherwise, according to their priority of lien, the class of property upon which they are secured, etc. Income bonds are generally bonds on which the interest is only payable if earned, and ordinarily are not secured by mortgage. Bonds are also named from the rate of interest they bear, or from the dates at which they are payable or redeemable, or from both; as, U. S. 4's 1907, Virginia 6's Western Union 7's, coupon, 1900, Lake Shore reg. 2d, 1903.

Brokerage and Commission.

A commission merchant, or factor, is an agent intrusted by his principal with goods to be sold, with the authority to deduct from the proceeds of the sales a certain sum agreed upon as compensation for his services, remitting the balance to his principal.

Such an agent impliedly agrees to perform his duties in a careful and diligent manner, and to obey the orders and instructions which he receives from his principal so far as he is able.

He is bound to exercise his judgment and discretion to the best advantage of his principal, and to render just and true accounts.

In the absence of special instructions to the contrary, he has an implied authority to sell at such times, and at such prices, as in the exercise of his discretion he may deem for the best interests of his principal.

He may sell on credit, if it is customary so to do, among those in the same business, unless he has received orders to the contrary.

All profits made by him in handling his principal's property or money, beyond his ordinary compensation, are for the benefit of the principal.

He cannot himself be the purchaser of the goods intrusted to

him to sell, unless he deals openly and fairly with his principal, and acquaints him with all the facts and circumstances material for him to know.

Bankruptcy.

Laws have been enacted in nearly all the States for the purpose of distributing the property of an insolvent debtor ratably among his creditors and discharging the debtor from further liability. Proceedings may be instituted by the debtor himself or by a creditor. As a general rule, proceedings in one State are not binding on a creditor residing in another State; but if Congress were to pass a national bankrupt law, this would annul all State laws on the subject, and proceedings under the national law would bind creditors in all the States and Territories.

Insolvency proceedings are generally commenced by a petition to the Judges of the court of insolvency, setting forth among other things the debtor's inability to pay all his debts in full, and his desire to surrender all his property for the benefit of his creditors.

If satisfied of the truth of matters alleged in the petition, the judge issues an order commanding the proper officer to take the debtor's property and hold it until a certain time, when the creditors meet and choose an assignee.

The assignee then takes charge of the property, turns it into money, and declares a dividend for the creditors.

Pending the proceedings, the debtor may be examined on oath for the purpose of making him disclose all matters concerning his property and the disposal thereof.

If the debtor has conformed to the insolvent law in all respects, he is entitled to a discharge from his debts, which is given him by the judge on the debtor's obtaining the requisite assent from the creditors.

In nearly all the States an insolvent debtor may, with the consent of his creditors, and in some States without such consent, assign all his property to a trustee for the benefit of his creditors, who converts it into money, dividing it *pro rata* among the creditors.

Terms Used on 'Change.

ACCOMMODATION PAPER.—Notes or bills not representing an actual sale or trade transaction, but merely drawn to be discounted for the benefit of drawer, acceptor or indorsers, or all combined.

BALANCE OF TRADE.—Difference in value between total imports and exports of a country.

BALLOONING.—To work up a stock far beyond its intrinsic worth by favorable stories or fictitious sales.

BEAR.—One who strives to depress the price of stocks, etc., and for this reason "goes short."

BUYING LONG.—Buying in expectation of a rise

BREADSTUFFS.—Any kind of grain, corn or meal.

BROKER.—An agent or factor; a middleman paid by commission.

BROKERAGE.—A percentage for the purchase or sale of money and stocks.

BULL.—A broker or dealer who believes that the value of stocks or breadstuffs will rise, and speculates for a rise.

CALL.—Demand for payment of installments due on stocks.

CALL.—A privilege given to another to "call" for delivery at a time and price fixed.

CLIQUE.—A combination of operators controlling large capital in order to unduly expand or break down the market.

COLLATERALS.—Any kind of values given in pawn when money is borrowed.

CORNERS.—The buying up of a large quantity of stocks or grain to raise the price. When the market is oversold, the shorts, if compelled to deliver, find themselves in a "corner."

CURBSTONE BROKERS.—Brokers or agents who are not members of any regular organization, and do business mainly on the sidewalk.

DELIVERY.—When stock or grain is brought to the buyer in exact accordance with the rules of the Exchange, it is called a good delivery. When there are irregularities, the delivery is pronounced bad, and the buyer can appeal to the Exchange.

DIFFERENCES.—The price at which a stock is bargained for and the rate or day of delivery are not usually the same, the variation being termed the difference.

FACTOR.—An agent appointed to sell goods on commission

FACTORAGE.—Commissions allowed factors.

FLAT.—Inactive; depressed; dull. The *flat* value of bonds and stocks is the value without interest.

FLYER.—A small side operation, not employing one's whole capital.

FORCING QUOTATIONS is where brokers wish to keep up the price of a stock and to prevent its falling out of sight. This is generally accomplished by a small sale.

GUNNING a stock is to use every art to produce a break when it is known that a certain house is heavily supplied and would be unable to resist an attack.

KITE-FLYING.—Expanding one's credit beyond wholesome limits.

LAME DUCK.—Stock-brokers' slang for one unable to meet his liabilities.

LONG.—One is *long* when he carries stock or grain for a rise.

POINTER.—A theory or fact regarding the market on which one bases a speculation.

POOL.—The stock or money contributed by a clique to carry through a corner.

PRICE CURRENT.—The prevailing price of merchandise, stock or securities.

SELLING SHORT.—To "sell short" is to sell for future delivery what one has not got, in hopes that prices will fall.

WATERING a stock is the art of doubling the quantity of stock without improving its quality.

THE INTER-STATE COMMERCE LAW.

The Inter-State Commerce Act is a law passed by Congress in 1887, for the regulation of rates and the management of inter-State commerce. It applies to carriers engaged in the transportation of passengers or property wholly by railroad or partly by railroad and partly by water, from one State, Territory or District of the United States to any other State, Territory or District, or to or from a foreign country. It provides for the appointment of a board of five commissioners, empowered to enquire into the management of the carriers and determine the reasonableness of their rates. A carrier whose line is entirely within a State is subject to the act so far as it makes or accepts through rates on inter-State commerce.

Among other things the act requires that all charges shall be just and reasonable; that charges for a shorter distance shall not

exceed those for a longer distance on the same line in the same direction, when the circumstances and conditions are similar; that there shall be no unjust discrimination as between persons or classes of traffic or localities, in the charges made or in the service rendered; that the rates charged for transportation shall be printed, filed with the Commission and kept for public inspection at the several stations, and that the carriers shall annually make a complete exhibit of their business to the Commission.

The act makes exceptions from its provisions of the carriage of property for the United States or for any State or municipal government, or for charitable purposes, or to or from fairs and expositions, and it allows of the issuing of mileage, excursion or commutation tickets, and admits of the giving of reduced rates to ministers of religion and free transportation to the officers and employes of the carrier, and to the principal officers of other carriers.

THE LAWS OF CHANCE.—Card-players who are continually bewailing their ill-luck of always receiving the same poor cards, will, perhaps, be reassured by knowing that the fifty-two cards, with thirteen to each of the four players, can be distributed in 53,644,737,756,488,792,839,237,440,000 different ways, so that there would still be a good stock of combinations to draw from, even if a man from Adam's time had devoted himself to no other occupation than that of playing at cards.

THE PLACE WHERE THE SUN JUMPS A DAY.—Chatham Island, lying off the coast of New Zealand, in the South Pacific Ocean, is peculiarly situated, as it is one of the habitable points of the globe where the day of the week changes. It is just in the line of demarkation between dates. There, at high 12 Sunday, noon ceases, and instantly Monday meridian begins. Sunday comes into a man's house on the east side and becomes Monday by the time it passe out the western door. A man sits down to his noonday dinner on Sunday, and it is Monday noon before he finishes it. There Saturday is Sunday and Sunday is Monday, and Monday becomes suddenly transferred into Tuesday. It is a good place for people who have lost much time, for by taking an early start they can always get a day ahead on Chatham Island. It took philosophers and geographers a long time to settle the puzzle of where Sunday noon ceased and Monday noon began with a man traveling west fifteen degrees an hour, or with the sun. It is to be hoped that the next English arctic expedition will settle the other mooted question: "Where will one stop who travels northwest continually?"

INSURANCE.

A *STOCK Insurance Company* is one whose capital is owned by stockholders, they alone sharing the profits and they alone being liable for losses. The business of such a company, and also of a mixed company, is managed by directors chosen by the stockholders. Policy-holders, unless at the same time stockholders, have no voice in the management of the company's business or in the election of its officers.

A Mutual Insurance Company is one in which the profits and losses are shared among the policy-holders (the insured.)

Mixed Companies are a combination of the foregoing. In a mixed company all profits above a certain fixed dividend are usually divided among the policy-holders.

Some mutual and mixed companies issue what are called *non-participating policies*. The holders of these do not share in the profits or losses.

FIRE INSURANCE.

Policies for fire insurance are generally issued for a period of one to five years. Ordinarily, in case of loss by fire, the insured will be paid the extent of his loss up to the amount of insurance, unless the insurance company prefer to replace or repair the damaged property, which privilege is usually reserved. If the policy contains the "average clause" the payment will cover only such portion of the loss as the amount of insurance bears to the value of the property insured.

A Floating Policy is one which covers property stored in several buildings or places. The name is applied more particularly to policies which cover goods whose location may be changed in process of manufacture, or in the ordinary course of business. The "average clause" is a usual condition of policies of this class.

Short Rates are rates for a term less than a year. If an insurance policy is terminated at the request of the policy-holder, the company retains the customary "short rates" for the time the policy has been in force, as shown by the following tables:

Policy for 1 year.	Policy for 2 years.	Policy for 3 years.	Policy for 4 years.	Policy for 5 years.	Charge this proportion of whole Premium.
1 mo.	2 mo.	3 mo.	4 mo.	5 mo.	20 per cent.
2 "	4 "	6 "	8 "	10 "	30 "
3 "	6 "	9 "	12 "	15 "	40 "
4 "	8 "	12 "	16 "	20 "	50 "
5 "	10 "	15 "	20 "	25 "	60 "
6 "	12 "	18 "	24 "	30 "	70 "
7 "	14 "	21 "	28 "	35 "	75 "
8 "	16 "	24 "	32 "	40 "	80 "
9 "	18 "	27 "	36 "	45 "	85 "
10 "	20 "	30 "	40 "	50 "	90 "
11 "	22 "	33 "	44 "	55 "	95 "

When a policy is terminated at the option of the company, a ratable portion of the premium is refunded for the unexpired term.

LIFE INSURANCE.

In ordinary life policies a certain premium is to be paid every year until the death of the insured, when the policy becomes payable to the beneficiary. There are other kinds of policies, however, and these are described below:

Limited Payment Life Policy.—Conditions: Premiums to be paid annually for a certain fixed number of years, or until the death of the insured, should that occur prior to the expiration of this period. Policy payable at death of the insured. Advantages: Payments on this kind of policy may all be made while the insured is best able to make them, and, if he live to an old age, the policy will not be a continual burden, but will rather be a source of income, as the yearly dividends may be taken out in cash or added to the amount of insurance.

Term Life Policy.—In this method of insurance, the insurance company agrees to pay to the beneficiaries a certain sum on the death of the insured, should that event occur within a fixed term.

Endowment Policy.—A combination of a Term Life Policy and a Pure Endowment. These policies are issued for endowment periods of 10, 15, 20, 25, 30 or 35 years, and may be paid up by a single payment, by an annual premium during the endowment period, or by five or ten annual payments. Conditions: 1. Insurance during a stipulated period, payable at the death of the insured, should that event happen within said period. 2. An endowment of the same amount as the policy, payable to the insured, if still living at the end of the period fixed. Advantages: Limited term of payments; insurance during the time when the death of the insured would cause most embarrassment to his family; provision for old age, as the amount of the policy will be paid to the insured if still living, at a time when advanced age may make it of great benefit.

Annuity Policies are secured by a single cash payment and insure the holder the yearly payment of a certain sum of money during life.

Joint Life Policy.—An agreement to pay a certain sum on the death of any one of two or more persons thus insured.

Non-forfeiting Policies do not become void for non-payment of premiums. In some companies all limited payment life policies, and all endowment policies, after premiums for three (or two) years have been paid, and the original policy is surrendered within a certain time, provide for paid-up assurance for as many parts of the original amount assured as there shall have been complete annual premiums received in cash by the company. Some companies voluntarily apply all credited dividends to the continuance of the insurance. Others apply the legal reserve to the purchase of term insurance at regular rates.

Special Forms.—The Reserve Endowment, Tontine Investment and other special policies guarantee to the holder a definite surrender value at the termination of certain periods. The surrender value of a policy is the amount in cash which the company will pay the holder of a policy on its surrender—the legal reserve less a certain per cent. for expenses.

The Reserve of life insurance policies is the present value of the amount to be paid at death less the present value of all the net premiums to be paid in the future.

The Reserve Fund of a life insurance company is that sum in hand which, invested at a given rate of interest, together with future premiums on existing policies, should be sufficient to meet all obligations as they become due. It is the sum of the separate reserves of the several policies outstanding.

The Expectation of Life is the number of years which one

may probably live. This average number of years has been determined from the experience of insurance companies.

Age.	Expectation in years.	Age.	Expectation in years.	Age.	Expectation in years.	Age.	Expectation in years.	Age.	Expectation in years.
0	28.15	20	34.22	40	26.04	60	15.45	80	5.85
1	36.78	21	33.84	41	25.61	61	14.86	81	5.50
2	38.74	22	33.46	42	25.19	62	14.26	82	5.16
3	40.01	23	33.08	43	24.77	63	13.66	83	4.87
4	40.73	24	32.70	44	24.35	64	13.05	84	4.66
5	40.88	25	32.33	45	23.92	65	12.43	85	4.57
6	40.69	26	31.93	46	23.37	66	11.96	86	4.21
7	40.47	27	31.50	47	22.83	67	11.48	87	3.90
8	40.14	28	31.08	48	22.27	68	11.01	88	3.67
9	39.72	29	30.66	49	21.72	69	10.50	89	3.56
10	39.23	30	30.25	50	21.17	70	10.06	90	3.43
11	38.64	31	29.83	51	20.61	71	9.60	91	3.32
12	38.02	32	29.43	52	20.05	72	9.14	92	3.12
13	37.41	33	29.02	53	19.49	73	8.69	93	2.40
14	36.79	34	28.62	54	18.92	74	8.25	94	1.98
15	36.17	35	28.22	55	18.35	75	7.83	95	1.62
16	35.76	36	27.78	56	17.78	76	7.40		
17	35.37	37	27.34	57	17.20	77	6.99		
18	34.98	38	26.91	58	16.63	78	6.59		
19	34.59	39	26.47	59	16.04	79	6.21		

MARINE AND TRANSIT INSURANCE.

Insurance of vessels and their cargoes against the perils of navigation is termed *Marine Insurance.*

Inland and Transit Insurance refer to insurance of merchandise while being transported from place to place either by rail or water routes, or both.

Insurance Certificates, showing that certain property has been insured and stating the amount of the insurance and the name of the party abroad who is authorized to make the settlement, are issued by marine companies. They are negotiable and are usually sent to the consignee of the merchandise to make the loss payable at the port of destination.

The adjustment of marine policies in case of loss is on the same principle as the adjustment of fire policies containing the "average clause."

Open Policies are such upon which additional insurances may be entered at different times.

NUMBER of families in the United States (census of 1880), 9,945,916; average number to a square mile, 3.43. Number of dwellings, 8,955,842; average to the square mile, 3.02. Number of acres to a family, 186.62. Number of persons to a family, 5.04. Number of persons to a dwelling, 5.6.

NUMBER of farms in the United States in 1880, 4,008,907; in 1870, 2,659,985; in 1860, 2,044,077; in 1850, 1,449,073.

INTERNAL REVENUE.

The internal revenue of the U. S. includes the taxes on spirits, tobacco, etc., and most of the receipts from national taxes, except customs duties and the receipts from the sale of public lands, patent fees, postal receipts, etc.

The Constitution declares that Congress has the power "to lay and collect taxes, duties, imports and excises," and that they shall be uniform throughout the U. S., and provides that direct taxes shall be apportioned among the States only in proportion to the population.

At the close of the revolution raising money by internal taxation was hardly thought of, and at that time the condition of the people and manufactures would not warrant it. The first internal revenue tax imposed by Congress was that of March 3, 1791, on distilled spirits of domestic manufacture, the enforcement of which led to the whiskey insurrection. In 1798 the first direct tax of the kind, one of $2,000,000, was apportioned among the States, and it was proposed that it should be levied on dwelling-houses, slaves and land.

All internal taxes were repealed in 1802 in accordance with the recommendation of President Jefferson, and no others were authorized until 1813, when the war with England necessitated an increased revenue. These taxes were continued a few years after the war, but were abolished, and none were levied until 1861.

The civil war forced a renewal of the internal revenue system, and in 1861 a direct tax of $20,000,000 was apportioned among the States. On July 1, 1862, an act was passed levying taxes on all sorts and kinds of articles too numerous to mention. A few industries were taxed out of existence and all were more or less disturbed, but the people submitted without opposition. Great reductions were made after the war ceased, and at the present time the only subjects of internal revenue taxation are tobacco, spirits, fermented liquors, bank circulation and oleomargarine.

The following have always been exempt from taxation in the U. S.:

Public property of both State and nation; the property of incorporated institutions of learning; houses of worship; cemeteries and the personal property of individuals, so far as to cover the necessities of life.

In 1792 the amount raised by internal revenue was $208,942; in 1866, $309,226,813; in 1887, $118,837,301.

YOU CANNOT COUNT A TRILLION.—It is impossible to count a trillion. Had Adam counted continuously from his creation to the present day, he would not have reached that number, for it would take him over 9,512 years. At the rate of 200 a minute, there could be counted 12,000 an hour, 288,000 a day, and 105,120,000 a year.

HINTS TO ADVERTISERS.

The first thing for an advertiser to decide is the mediums which reach the desired class of customers. Cheap mediums do not, as a rule, bring good returns, neither does it follow that a periodical claiming a large circulation takes precedence over one with a less circulation. The tone of the publication and character of its readers determine much. A first class periodical with a *bona fide* paid circulation is far more desirable than a much larger sample copy circulation. People who think enough of a publication to buy it are very apt to read it.

Except in special cases, hand-bills and dodgers are of little or no account.

The advertisement must be attractive, and if lasting results be desired, the goods must be as represented, and the advertisement honestly worded.

The occasional advertiser reaps but meager results; 'tis the constant, persistent advertiser who reaps the most benefit.

The secret of success in advertising lies largely in keeping the name and goods constantly before the eye of the public.

Printer's ink is beneficial to any business, but common sense and good judgment are absolutely necessary. The shrewd advertiser and successful business man exercises as much care and discretion in placing his advertisement as he does in buying his goods.

HOW TO COLLECT A DEBT.

Thousands of dollars are lost every day through negligence or carelessness of creditors.

If there is a fixed date for payment, be on hand promptly to receive it.

If not paid, follow it up closely.

If party cannot pay now, get a promise for another date of payment. Pleasant words and a genial bearing invariably are more effective than threats of legal measures.

If the debtor lives near, call and express your urgent needs of money, etc.

If you cannot get it all, take a part, and get a note for the balance. Notes are more easily handled and collected than open accounts.

If the debtor is irresponsible, get him to secure an indorser, so that you "can get the money on it at the bank," etc.

If possible, "know your man."

With some it is absolutely necessary to be sharp and positive, while the man who honestly intends to pay can be handled better by pleasant words, though frank and business-like.

If a debtor is at a distance, write a courteous letter, inclosing bill or statement, requesting prompt settlement.

If necessary, a second or third letter should be written.

HOW TO MAKE CHANGE QUICKLY.

Always consider the amount of purchase as if that much money were already counted out, then add to amount of purchase enough small change to make even dollars, counting out the even dollars last until full amount is made up.

If the purchase amounts to 57 cents, and you are handed $2.00 in payment, count out 43 cents first to make an even dollar. Then lay out the other dollar.

Should the purchase be $3.69, to be taken out of $20,00, begin with $3.69 as the basis and make up even $4.00 by laying out 31 cents. This 31 cents with the amount of the purchase you will consider as $4.00, and count out even dollars to make up the $20.00 which the customer has handed in.

MERCHANTS' COST AND PRICE MARKS.

All merchants use private cipher marks to note cost or selling price of goods. The cipher is usually made up from some short word or sentence of nine or ten letters, as:

C O R N E L I U S, A.
1 2 3 4 5 6 7 8 9 0.

Five dollars, according to this key, would be *eaa*. But generally an extra letter is used to prevent repeating the mark for 0. If the sign for *a* second 0 in this case were *y*, we would have *eay* instead of *eaa*.

TIME IN WHICH MONEY DOUBLES.

Per Cent.	Simple Int.	Comp. Int.	Per Cent.	Simple Int.	Comp. Int.
2	50 years.	35 years.	5	20 years.	14 yrs. 75 da.
2½	40 years.	28 yrs. 26 da.	6	16 yrs. 8 mos.	11 yrs. 327 da.
3	33 yrs. 4 mos.	23 yrs. 164 da.	7	14 yrs. 104 da.	10 yrs. 89 da.
3½	28 yrs. 208 da.	20 yrs. 54 da.	8	12½ years.	9 yrs. 2 da.
4	25 years.	17 yrs. 246 da.	9	11 yrs. 40 da.	8 yrs. 16 da.
4½	22 yrs. 81 da.	15 yrs. 273 da.	10	10 years.	7 yrs. 100 da.

"A Dollar Saved, a Dollar Earned."

The way to accumulate money is to save small sums with regularity. A small sum saved daily for fifty years will grow at the following rate:

Daily Savings.	Result.	Daily Savings.	Result.
One cent	$ 950	Sixty cents	$ 57,024
Ten cents	9,504	Seventy cents	66,528
Twenty cents	19,006	Eighty cents	76,032
Thirty cents	28,512	Ninety cents	85,537
Forty cents	38,015	One Dollar	475,208
Fifty cents	47,520		

SHORT INTEREST RULES.

To find the interest on a given sum for any number of days, at any rate of interest, multiply the principal by the number of days and divide as follows:

At 3 per cent., by 120	At 9 per cent., by . . . 40
At 4 per cent., by 90	At 10 per cent., by 36
At 5 per cent., by 72	At 12 per cent., by . . . 30
At 6 per cent., by 60	At 15 per cent., by 24
At 7 per cent., by 52	At 20 per cent., by . . . 18
At 8 per cent., by . . . 45	

TRADE DISCOUNTS.

Wholesale houses usually invoice their goods to retailers at "list" prices. List prices were once upon a time supposed to be retail prices, but of late a system of "long" list prices has come into vogue in many lines of trade—that is, the list price is made exorbitantly high, so that wholesalers can give enormous discounts. These discounts, whether large or small, are called trade discounts, and are usually deducted at a certain rate per cent. from the face of invoice.

The amount of discount generally depends upon size of bill or terms of settlement, or both. Sometimes two or more discounts are allowed. Thus 30% and 5% is expressed 30 and 5, meaning first a discount of 30% and then 5% from the remainder.

30 and 5 is not 35%, but 33½%. 10, 5 and 3 off means three successive discounts.

A wholesale house allowing 10, 5 and 3 off gets more for its goods than it would at 18 off.

HOW TO DETECT COUNTERFEIT MONEY.

In the space at disposal here, it is impossible of course to give a complete illustrated counterfeit detector, but the following simple rules, laid down by Bank Note Examiner Geo. R. Baker, will be found extremely valuable:

Examine the form and features of all human figures; if graceful, and features distinct, examine the drapery. Notice whether the folds lie naturally, and observe whether the fine strands of the hair are plain and distinct.

Examine the lettering. In a genuine bill it is absolutely perfect. There has never been a counterfeit put out but was more or less defective in the lettering.

Counterfeiters rarely, if ever, get the imprint or engraver's name perfect. The shading in the background of the vignette and over and around the letters forming the name of the bank, on a good bill, is even and perfect; on a counterfeit it is uneven and imperfect.

The die work around the figures of the denomination should be of the same character as the ornamental work surrounding it.

Never take a bill deficient in any of these points.

BIG TREES.—Of ninety-two redwood trees in Calaveras Grove, Cal., ten are over thirty feet in diameter, and eighty-two have a diameter of from fifteen to thirty feet. Their ages are estimated at from 1,000 to 3,500 years. Their height ranges from 150 to 237 feet.

BANKERS' TIME TABLE.

To Find the Number of Days Between Any Two Dates of the Same Year, or Two Consecutive Years,

Consult the following table. The numbers in black letter at head of the columns represent the months:—1, January; 2, February, etc. In leap years, add one to the corresponding numbers of all dates after February 28.

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	32	60	91	121	152	182	213	244	274	305	335
2	2	33	61	92	122	153	183	214	245	275	306	336
3	3	34	62	93	123	154	184	215	246	276	307	337
4	4	35	63	94	124	155	185	216	247	277	308	338
5	5	36	64	95	125	156	186	217	248	278	309	339
6	6	37	65	96	126	157	187	218	249	279	310	340
7	7	38	66	97	127	158	188	219	250	280	311	341
8	8	39	67	98	128	159	189	220	251	281	312	342
9	9	40	68	99	129	160	190	221	252	282	313	343
10	10	41	69	100	130	161	191	222	253	283	314	344
11	11	42	70	101	131	162	192	223	254	284	315	345
12	12	43	71	102	132	163	193	224	255	285	316	346
13	13	44	72	103	133	164	194	225	256	286	317	347
14	14	45	73	104	134	165	195	226	257	287	318	348
15	15	46	74	105	135	166	196	227	258	288	319	349
16	16	47	75	106	136	167	197	228	259	289	320	350
17	17	48	76	107	137	168	198	229	260	290	321	351
18	18	49	77	108	138	169	199	230	261	291	322	352
19	19	50	78	109	139	170	200	231	262	292	323	353
20	20	51	79	110	140	171	201	232	263	293	324	354
21	21	52	80	111	141	172	202	233	264	294	325	355
22	22	53	81	112	142	173	203	234	265	295	326	356
23	23	54	82	113	143	174	204	235	266	296	327	357
24	24	55	83	114	144	175	205	236	267	297	328	358
25	25	56	84	115	145	176	206	237	268	298	329	359
26	26	57	85	116	146	177	207	238	269	299	330	360
27	27	58	86	117	147	178	208	239	270	300	331	361
28	28	59	87	118	148	179	209	240	271	301	332	362
29	29	..	88	119	149	180	210	241	272	302	333	363
30	30	..	89	120	150	181	211	242	273	303	334	364
31	31	..	90	...	151	...	212	243	...	304	...	365

	1	2	3	4	5	6	7	8	9	10	11	12
1	366	397	425	456	486	517	547	578	609	639	670	700
2	367	398	426	457	487	518	548	579	610	640	671	701
3	368	399	427	458	488	519	549	580	611	641	672	702
4	369	400	428	459	489	520	550	581	612	642	673	703
5	370	401	429	460	490	521	551	582	613	643	674	704
6	371	402	430	461	491	522	552	583	614	644	675	705
7	372	403	431	462	492	523	553	584	615	645	676	706
8	373	404	432	463	493	524	554	585	616	646	677	707
9	374	405	433	464	494	525	555	586	617	647	678	708
10	375	406	434	465	495	526	556	587	618	648	679	709
11	376	407	435	466	496	527	557	588	619	649	680	710
12	377	408	436	467	497	528	558	589	620	650	681	711
13	378	409	437	468	498	529	559	590	621	651	682	712
14	379	410	438	469	499	530	560	591	622	652	683	713
15	380	411	439	470	500	531	561	592	623	653	684	714
16	381	412	440	471	501	532	562	593	624	654	685	715
17	382	413	441	472	502	533	563	594	625	655	686	716
18	383	414	442	473	503	534	564	595	626	656	687	717
19	384	415	443	474	504	535	565	596	627	657	688	718
20	385	416	444	475	505	536	566	597	628	658	689	719
21	386	417	445	476	506	537	567	598	629	659	690	720
22	387	418	446	477	507	538	568	599	630	660	691	721
23	388	419	447	478	508	539	569	600	631	661	692	722
24	389	420	448	479	509	540	570	601	632	662	693	723
25	390	421	449	480	510	541	571	602	633	663	694	724
26	391	422	450	481	511	542	572	603	634	664	695	725
27	392	423	451	482	512	543	573	604	635	665	696	726
28	393	424	452	383	513	544	574	605	636	666	697	727
29	394	...	453	484	514	545	575	606	637	667	698	728
30	395	...	554	485	515	546	576	607	638	668	699	729
31	396	...	445	...	516	...	577	608	...	669	...	730

FACTS ABOUT RAILROADS AND TRANSPORTATION.

Twenty Points on American Railroading.

1. There are in the United States 150,600 miles of railway—about half the mileage of the world. 2. The estimated cost is $9,000,000,000. 3. The number of people employed by American railways is more than 1,000,000. 4. The fastest time made by a train is 422 6-10 miles in 7 hours, 23 minutes (443 minutes), one mile being made in 47 11-29 seconds, on the West Shore Railroad, New York. 5. The cost of a high-class eight-wheel passenger locomotive is about $8,500. 6. The longest mileage operated by a single system is that of the Atchison, Topeka & Santa Fe—about 8,000 miles. 7. The cost of a palace sleeping-car is about $15,000, or $17,000 if "vestibuled." 8. The longest railway bridge span in the United States is the Cantilever span in Poughkeepsie bridge—548 feet. 9. The highest railroad bridge in the United States is the Kinzua viaduct on the Erie road—305 feet high. 10. The first locomotive in the United States was built by Peter Cooper. 11. The road carrying the largest number of passengers is the Manhattan Elevated Railroad, New York—525,000 a day, or 191,625,000 yearly. 12. The average daily earning of an American locomotive is about $100. 13. The longest American railway tunnel is the Hoosac, on the Fitchburgh railway—4¾ miles. 14. The average cost of constructing a mile of railroad at the present time is about $30,000. 15. The first sleeping-car was used upon the Cumberland Valley Railroad of Pennsylvania; from 1836 to 1848. 16. The chances of fatal accident in railway travel are very slight—one killed in ten million. Statistics show more are killed by falling out of windows than in railway accidents. 17. The line of railway extending farthest east and west is the Canadian Pacific, running from Quebec to the Pacific Ocean. 18. A steel rail, with average wear, lasts about eighteen years. 19. The road carrying the largest number of commuters is the Illinois Central at Chicago—4,828,128 commutation fares in 1887. 20. The fastest time made between Jersey City and San Francisco is 3 days, 7 hours, 39 minutes and 16 seconds. Special theatrical train, June, 1876.

Train Management.

("Standard Code.")

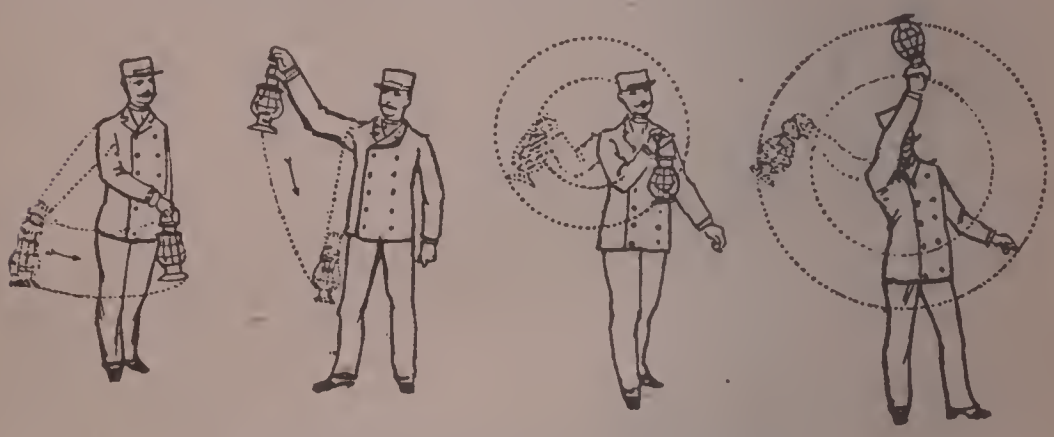
A train while running must display two green flags by day and two green lights by night, one on each side of the rear of the train.

After sunset, or when obscured by fog or other cause, must display headlight in front and two red lights in rear.

Two green flags by day and two green lights by night, displayed in the places provided for that purpose on the front of an engine, denote that the train is followed by another train running on the same schedule and entitled to the same time-table rights as the train carrying the signals.

Two white flags by day and two white lights by night, carried in the same manner, denote that the train is an extra.

A blue flag by day and a blue light by night, placed on the end of a car, denotes that car inspectors are at work under or about the car or train and that it must not be coupled to or moved until the blue signal is removed.



Swinging Lamp Signals.

1. A lamp swung across the track is the signal to stop. 2. A lamp raised and lowered vertically is the signal to move ahead. 3. A lamp swung vertically in a circle across the track, when the train is standing, is the signal to move back. 4. A lamp swung vertically in a circle at arm's length across the track, when the train is running, is the signal that the train has parted.

*** A flag, or the hand, moved in any of the directions given above, will indicate the same signal as given by a lamp.

Colored Flag or Lantern Signals—Torpedoes.

("Standard Code.")

Red signifies danger.

Green signifies caution, go slowly.

White signifies safety.

Green and white signifies stop at flag stations for passengers or freight.

One cap or torpedo on rail means stop immediately.

Two caps or torpedoes on rail means reduce speed immediately and look out for danger signal.

Locomotive Whistle Signals.

Just one long blast on the whistle, ——— this style,
Is a sign of nearing town,
A railroad crossing or junction, may be,
And this —, the brakes whistled down.

Two long ——— ——— are just the reverse of the last.
And this — — the engine's reply
When word comes from the conductor to stop, —
A sort of cheerful "Aye! aye!"

These three ——— ——— ——— will show when the train comes apart.
This — — — means two different things:
That the train will back, or asks you to note
Some special signal it brings.

These four ——— ——— ——— ——— belong to the flagman alone,
And these — — — — are meant for the crew;
But this one ——— ——— — —, when crossing a road at grade,
More nearly interests you.

Five short ones — — — — — say to the flagman on guard,
"Look out for a rear attack!"
And a lot like this — — — — — — — that a heedless cow
Or a deaf man is on the track!

D. B. BARNARD.

Speed on Railroads.

Speed is hard to average. An average of 48 3-10 miles per hour is the fastest regular time in the United States. This is made on the Pennsylvania "limited" in its run from Jersey City to Philadelphia, 90 miles, in 112 minutes. The Flying Dutchman train is supposed to make the fastest time in the world, between London and Bristol, 118¼ miles, in less than two hours. The average, however, of even this fast train is only 59⅛ miles per hour. There are several other trains noted for remarkably fast time on short distances. Sometimes a straight and even grade for a distance of 20 miles will permit a train to run at the rate of more than a mile a minute. One train on the Canadian Pacific road, from Cotaneau to Ottawa, averages 50 miles an hour for a distance of 78 miles. An average of 38½ miles an hour is considered fast traveling.

The largest and fastest passenger engine ever built is said to have been turned out of the Rhode Island Locomotive Works, at Providence, for the New York, Providence & Boston Railroad Company. She was designed to make the run from Providence to Groton, Conn., a distance of 62½ miles, including a dead stop at Mystic draw-bridge, as required by the statutes of Connecticut, in just 62½ minutes, pulling at the same time eight cars, four of them Pullmans.

Steamboating.

The first idea of steam navigation was contained in a patent obtained in England by Hulls in 1736.

Fitch experimented in steam navigation on the Delaware river in 1783-4.

Oliver Evans was the next experimenter in steam navigation in 1785-6.

Ramsey was also an experimenter in Virginia in steam navigation in 1787.

W. Symington made a trial on the Forth and Clyde with a small but rudely constructed model of a steamer in 1789.

Chancellor Livingston built a steamer on the Hudson in 1797.

The first experiment in steamboating on the Thames, England, was in 1801.

Mr. Symington repeated his experiments on the Thames with success in 1802.

Fulton built the steamer, the North River, and in 1807 made a passage up the Hudson river to Albany from New York in thirty-three hours—the first steam navigation on record.

The next steamboat was the Car of Neptune, in 1808.

Fulton built the Orleans at Pittsburgh—the first steamer on

western rivers. It was completed, and made the voyage to New Orleans, 2,000 miles, in 1811.

The first steam vessels of Europe commenced plying on the Clyde in 1812.

The Savannah, the first steamer to cross the ocean, was of 350 tons burden, and sailed for Liverpool from Savannah, Ga., July 15, 1819.

Capt. Johnson was paid £10,000, or $50,000, for making the first steam voyage to India. The voyage was made on the steamer Enterprise, which sailed from Falmouth, England, Aug. 16, 1825.

The first war steamer was built in England in 1838.

Capacity of a Ten-Ton Freight Car.

Whisky	60 barrels.	Lumber, green	6,000 feet.
Salt	70 "	Lumber, dry	10,000 feet.
Lime	70 "	Barley	300 bush.
Flour	90 "	Wheat	340 "
Eggs	130 to 160 "	Apples	370 "
Flour	200 sacks.	Corn	400 "
Cattle	18 to 20 head.	Potatoes	430 "
Hogs	50 to 60 "	Oats	680 "
Sheep	80 to 100 "	Bran	1,000 "

Facts About the Thermometer.

	Reaumur.	Centigrade.	Fahrenheit.
Freezing Point	0	0	32
Vine Cultivation	8	10	50
Cotton Cultivation	16	20	68
Temperature of Brazil	24	30	87
Hatching Eggs	32	40	104
	40	50	122
	48	60	140
	56	70	158
	64	80	176
	72	90	194
Water boils	80	100	212

Ice melts at 32°; temperature of globe, 50°; blood heat, 98°; alcohol boils, 174°; water boils, 212°; lead melts, 594°; heat of common fire, 1,140°; brass melts, 2,233°; iron melts, 3,479°.

Comparison of Thermometric Scales.

To convert the degrees of Centigrade into those of Fahrenheit, multiply by 9, divide by 5, and add 32.

To convert degrees of Centigrade into those of Reaumur, multiply by 4, and divide by 5.

To convert degrees of Fahrenheit into those of Centigrade, deduct 32, multiply by 5, and divide by 9.

To convert degrees of Fahrenheit into those of Reaumur, deduct 32, divide by 9, and multiply by 4.

To convert degrees of Reaumur into those of Centigrade, multiply by 5, and divide by 4.

To convert degrees of Reaumur into those of Fahrenheit, multiply by 9, divide by 4, and add 32.

In De Lisle's thermometer, used in Russia, the gradation begins at boiling point, which is marked zero, and the freezing point is 150.

FREEZING, FUSING AND BOILING POINTS.

Substances.	Reaumur.	Centi-grade.	Fahren-heit.
Freezing—			
Bromine freezes at	—16°	—20°	— 4°
Oil Anise	8	10	50
" Olive	8	10	50
" Rose	12	15	60
Quicksilver	—31.5	—39.4	—39
Water	— 1	0	32
Fusing—			
Bismuth metal fuses at	200	264	507
Cadmium	248.8	315	592
Copper	874.6	1093	2000
Gold	961	1200	2200
Iodine	92	115	239
Iron	1230	1538	2800
Lead	255.5	325	617
Potassium	46	58	136
Phosphorus	34	44	111
Silver	816.8	1021	1870
" Nitrate	159	198	389
Sodium	72	90	194
Steel	1452	1856	3300
Sulphur	72	90	194
Tin	173	230	446
Zinc	328	410	770
Boiling—			
Alcohol boils at	63	78	173
Bromine	50	53	145
Ether	28	35	95
" Nitrous	11	14	57
Iodine	140	175	347
Olive Oil	252	315	600
Quicksilver	280	350	662
Water	80	100	212

Dangers of Foul Air.—If the condensed breath collected on the cool window panes of a room where a number of persons have been assembled be burned, a smell as of singed hair will show the presence of organic matter, and if the condensed breath be allowed to remain on the windows for a few days, it will be found, on examination by the microscope, that it is alive with animaculæ. It is the inhalation of air containing such putrescent matter which causes half of the sick-headaches, which might be avoided by a circulation of fresh air.

FREEZING MIXTURES WITHOUT ICE.

Use water not warmer than 50° Fahrenheit.

Mixtures.		Down to	Change
Nitrate Ammonia, Water,	each one part	50°	4°	46°
Muriate Ammonia, Nitrate of Potash,	each five parts	50	10	40
Water, sixteen parts				
Muriate Ammonia, Nitrate of Potash,	each five parts	50	4	46
Sulphate of Soda, eight parts				
Water, sixteen parts				
Sulphate of Soda, three parts		50	— 3	53
Dilute Nitric Acid, two parts				
Nitrate of Ammonia, Carbonate Soda, Water,	each one part	50	— 7	57
Phosphate Soda, nine parts		50	—12	62
Dilute Nitric Acid, four parts				
Sulphate of soda, five parts		50	3	47
Dilute Sulphuric Acid, four parts				
Sulphate of Soda, six parts		50	—10	60
Muriate Ammonia, four parts				
Nitrate of Potash, two parts				
Dilute Nitric Acid, four parts				
Sulphate of Soda, six parts		50	—14	64
Nitrate of Ammonia, five parts				
Dilute Nitric Acid, four parts				

THE HEBREW RACE.

The Hebrew race is distributed over the Eastern continent as follows :

In Europe there are 5,400,000 ; in France, 63,000 ; Germany, 562,000, of which Alsace-Loraine contains 39,000 ; Austro-Hungary, 1,544,000 ; Italy, 40,000 ; Netherlands, 82,000 ; Roumania, 265,000 ; Russia, 2,552,000 ; Turkey, 105.000, and in other countries 35,000, Belgium containing the smallest number, only 3,000.

In Asia there are 319,000 ; Asiatic Turkey, 47,000, in Palestine there being 25,000 ; Asiatic Russia, 47,000 ; Persia, 18,000 ; Middle Asia, 14,000 ; India, 19,000, and China, 1,000.

Africa contains 350,000 ; Egypt, 8,000 ; Tunis, 55,000 ; Algiers, 35,000 ; Morocco, 60,000 ; Tripoli, 6,000, and Abyssinia, 200,000.

The entire number of Hebrews in the world is nearly 6,300,000.

PHYSICAL EXERCISE.

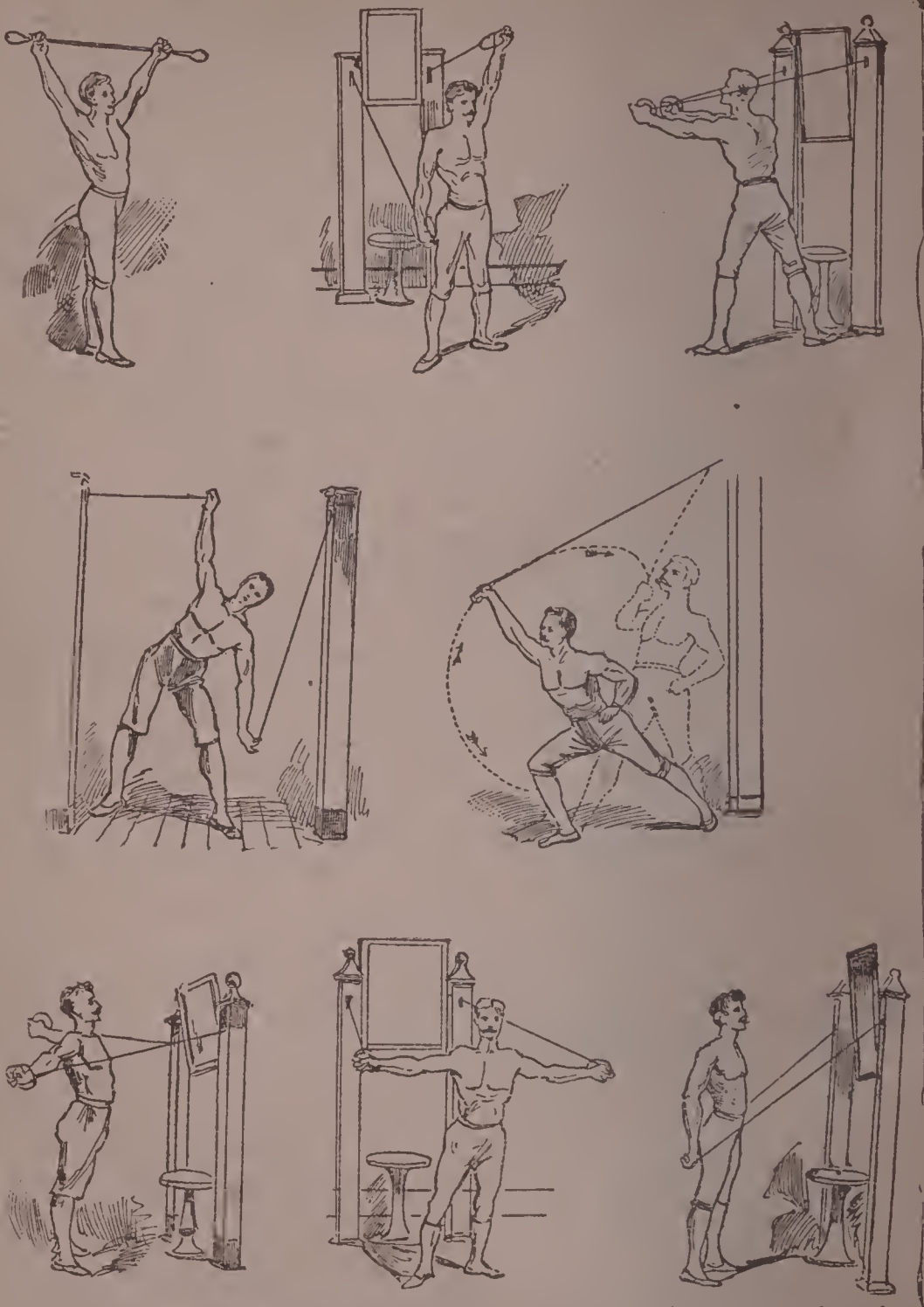
THE principal methods of developing the physique now prescribed by trainers are exercise with dumbbells, the bar bell and the chest weight. The rings and horizontal and parallel bars are also used, but not nearly to the extent that they formerly were. The movement has been all in the direction of the simplification of apparatus; in fact, one well-known teacher of the Boston Gymnasium when asked his opinion said: "Four bare walls and a floor, with a well-posted instructor, is all that is really required for a gymnasium."

Probably the most important as well as the simplest appliance for gymnasium work is the wooden dumbbell, which has displaced the ponderous iron bell of former days. Its weight is from three-quarters of a pound to a pound and a half, and with one in each hand a variety of motions can be gone through, which are of immense benefit in building up or toning down every muscle and all vital parts of the body.

The first object of an instructor in taking a beginner in hand is to increase the circulation. This is done by exercising the extremities, the first movement being one of the hands, after which come the wrists, then the arms, and next the head and feet. As the circulation is increased the necessity for a larger supply of oxygen, technically called "oxygen-hunger," is created, which is only satisfied by breathing exercises, which develop the lungs. After the circulation is in a satisfactory condition, the dumbbell instructor turns his attention to exercising the great muscles of the body, beginning with those of the back, strengthening which holds the body erect, thus increasing the chest capacity, invigorating the digestive organs, and, in fact, all the vital functions. By the use of very light weights an equal and symmetrical development of all parts of the body is obtained, and then there are no sudden demands on the heart and lungs.

After the dumbbell comes exercise with the round, or bar bell. This is like the dumbbell, with the exception that the bar connecting the balls is four or five feet, instead of a few inches in length. Bar bells weigh from one to two pounds each, and are found most useful in building up the respiratory and digestive systems, their especial province being the strengthening of the erector muscles and increasing the flexibility of the chest.

Of all fixed apparatus in use the pulley weight stands easily first in importance. These weights are available for a greater variety of objects than any other gymnastic appliance, and can be used either for general exercise or for strengthening such muscles as most require it. With them a greater localization is possible than with the dumbbell, and for this reason they are recommended as a kind of supplement to the latter. As chest de-



1. The bar bell—chest expander. 2. Anterior muscular developer. 3. Developing loins and lumbar region—aid to digestion. 4. Side and loin development. 5. Giant pulley exercise—for elevating right side of chest. 6. Developing muscles that hold the shoulders back. 7. Developing muscles of front upper chest. 8. Posterior development—to make one erect. [192

velopers and correctors of round shoulders they are most effective. As the name implies, they are simply weights attached to ropes, which pass over pulleys, and are provided with handles. The common pulley is placed at about the height of the shoulder of an average man, but recently those which can be adjusted to any desired height have been very generally introduced.

When more special localization is desired than can be obtained by means of the ordinary apparatus, what is known as the double-action chest weight is used. This differs from the ordinary kind in being provided with several pulleys, so that the strain may come at different angles. Double-action weights may be divided into three classes—high, low and side pulleys—each with its particular use.

The highest of all, known as the giant pulleys, are made especially for developing the muscles of the back and chest, and by stretching or elongating movements to increase the interior capacity of the chest. If the front of the chest is full and the back or side chest deficient, the pupil is set to work on the giant pulley. To build up the side-walls he stands with the back to the pulley-box and the left heel resting against it; the handle is grasped in the right hand if the right side of the chest is lacking in development, and then drawn straight down by the side; a step forward with the right foot, as long as possible, is taken, the line brought as far to the front and near the floor as can be done, and then the arm, held stiff, allowed to be drawn slowly up by the weight. To exercise the left side the same process is gone through with, the handle grasped in the left hand. Another kind of giant pulley is that which allows the operator to stand directly under it, and is used for increasing the lateral diameter of the chest. The handles are drawn straight down by the sides, the arms are then spread and drawn back by the weights. Generally speaking, high pulleys are most used for correcting high, round shoulders; low pulleys for low, round shoulders; side pulleys for individual high or low shoulders, and giant pulleys for the development of the walls of the chest and to correct spinal curvature.

The traveling rings, a line of iron rings covered with rubber and attached to long ropes fastened to the ceiling some ten feet apart, are also valuable in developing the muscles of the back, arms and sides. The first ring is grasped in one hand and a spring taken from an elevated platform. The momentum carries the gymnast to the next ring, which is seized with the free hand, and so the entire length of the line is traversed. The parallel bars, low and high, the flying rings, the horizontal bar and the trapeze all have their uses, but of late years they have been relegated to a position of distinct inferiority to that now occcupied by the dumbbells and pulley weights

MEDICINE AND HYGIENE.

Diseases and their Remedies.—Prescriptions by Eminent Practitioners.

IT should be clearly understood, that in all cases of disease, the advice of a skillful physician is of the first importance. It is not, therefore, intended by the following information to supersede the important and necessary practice of the medical man; but rather, by exhibiting the treatment required, to show in what degree his aid is imperative. In cases, however, where the disorder may be simple or transient, or in which remote residence, or other circumstances, may deny the privilege of medical attendance, the following particulars will be found of the utmost value. Moreover, the hints given upon what should be AVOIDED will be of great service to the patient, since the *physiological* is no less important than the *medical* treatment of disease. The numbers refer to prescriptions on pp. 315–318.

APOPLEXY—Lay the head upon a bag of pounded ice, immediate and large bleeding from the arm, cupping neck, leeches to the temples, aperients Nos. 1 and 7, one or two drops of cotton oil rubbed or dropped on the tongue. Avoid excesses, intemperance, animal food.

BILE, BILIOUS, OR LIVER COMPLAINTS—Abstinence from malt liquor, cool homœopathic cocoa for drink, no tea or coffee, few vegetables, no broths or soups; lean juicy meat not overcooked for dinner, with stale bread occasionally and a slice of toasted bacon for breakfast. Nos. 44 and 45.

CHICKEN POX—Mild aperients, No. 4, succeeded by No. 7, and No. 8, if much fever accompany the eruption.

CHILBLAINS—Warm, dry woolen clothing to exposed parts in cold weather, as a preventive. In the first stage, friction with No. 48, used cold. When ulcers form they should be washed twice daily with carbolic soap and dressed with benzoted zinc ointment. Or, chilblains in every stage, whether of simple inflammation or open ulcer, may always be successfully treated by Goulard's extract, used pure or applied on lint twice a day.

COMMON CONTINUED FEVER—Aperients; in the commencement No. 1, followed by No. 7; then diaphoretics, No. 8, and afterwards tonics, No 13, in the stage of weakness. Avoid all excesses.

COMMON COUGH—The linctus, No 42 or No. 43, abstinence from malt liquor, and protection from cold, damp air. Avoid cold, damp, and draughts.

CONSTIPATION—The observance of a regular period of evacuating the bowels, which is most proper in the morning after breakfast. The use of mild aperients, No. 37, and brown bread instead of white. There should be an entire change in the dietary for a few days while taking opening medicine.

CONSUMPTION—The disease may be complicated with various morbid conditions of the lungs and heart, which require appropriate treatment. Take cod liver oil, malt and whisky. To allay the cough, No. 32 is an admirable remedy. Avoid cold, damp, excitement and over-exertion.

CONVULSIONS (CHILDREN)—If during teething, free lancing of the gums, the warm bath, cold applications to the head, leeches to the temples, an emetic, and a laxative clyster, No. 20.

CROUP—Leeches to the throat, with hot fomentations as long as the attack lasts; the emetic, No. 16, afterwards the aperient, No. 5. Avoid cold and damp. Keep the air in the sick-room moistened with steam.

A SIMPLE CROUP REMEDY.—Take the white of an egg, stir it

thoroughly into a small quantity of sweetened water, and give it in repeated doses until a cure is effected. If one egg is not sufficient, a second, or even a third should be used.

DROPSY—Evacuate the water by means of No. 10, and by rubbing camphorated oil into the body night and morning.

EPILEPSY—If accompanied or produced by fullness of the vessels of the head, leeches to the temples, blisters, and No. 1 and No. 7. If from debility or confirmed epilepsy, the mixture No. 18. Avoid drinking and excitement. Let the patient alone during the convulsion.

ERUPTIONS ON THE FACE—The powder, No. 30, internally, sponging the face with the lotion No. 31. Avoid excesses in diet.

ERYSIPELAS—Aperients, if the patient be strong, No. 1, followed by No. 7, then tonics, No. 27. No. 27 may be used from the commencement for weak subjects.

FAINTNESS—Effusion of cold water on the face, stimulants to the nostrils, pure air, and the recumbent position; afterwards, avoidance of the exciting cause. Avoid excitement.

FROST-BITE AND FROZEN LIMBS—No heating or stimulating liquors must be given. Rub the parts affected with ice, cold, or snow water, and lay the patient on a cold bed.

GOUT—The aperients No. 1, followed by No. 24, bathing the parts with gin-and-water; for drink, weak tea or coffee. Warmth by flannels. Abstain from wines, spirits, and animal food.

GRAVEL—No. 5, followed by No. 7, the free use of magnesia as an aperient. The pill No. 22. Abstain from fermented drinks and hard water. Another form of gravel must be treated by mineral acids, given three times a day.

WHOOPING COUGH—Whooping cough may be complicated with congestion or inflammation of the lungs, or convulsions, and then becomes a serious disease. If uncomplicated, No. 43.

HYSTERICS—The fit may be prevented by the administration of thirty drops of laudanum, and as many of ether. When it has taken place, open the windows, loosen the tight parts of the dress, sprinkle cold water on the face, etc. A glass of wine or cold water when the patient can swallow. Avoid excitement and tight lacing.

INDIGESTION—The pills No. 2, with the mixture No. 18, at the same time abstinence from veal, pork, mackerel, salmon, pastry, and beer; for drink, homœopathic cocoa, a glass of cold spring water the first thing every morning. Avoid excesses.

INFLAMMATION OF THE BLADDER—Aperients No. 5 and No. 7, the warm bath, afterwards opium; the pill No. 11, three times a day till relieved. Avoid fermented liquors, etc. Large quantities of water should be taken, especially spring water containing lithia.

INFLAMMATION OF THE BOWELS—Leeches, blisters, fomentations, hot baths, iced drinks, the pills No. 19; move the bowels with clysters, if necessary, No. 20. Avoid cold, indigestible food, etc.

INFLAMMATION OF THE BRAIN—Application of cold to the head, bleeding from the temples or back of the neck by leeches or cupping; aperients No. 1, followed by No. 7, No. 15. Avoid excitement, study, intemperance.

INFLAMMATION OF THE KIDNEYS—Leeches over the seat of pain, aperients No. 5, followed by No. 49; the warm bath. Avoid violent exercise, rich living.

INFLAMMATION OF THE LIVER—Leeches over the right side, the seat of pain, blisters, aperients No. 1, followed by No. 7, afterwards the pills No. 19, till the gums are slightly tender. Avoid cold, damp, intemperance, and anxiety.

INFLAMMATION OF THE LUNGS—Leeches to seat of pain,

succeeded by a blister; the demulcent mixture, No. 14, to allay the cough, with the powders No. 15, whisky and milk. Avoid cold, damp, and draughts.

INFLAMMATION OF THE STOMACH—Leeches to the pit of the stomach, followed by fomentations, cold iced water for drink, bowels to be evacuated by clysters; abstinence from all food except cold gruel, milk and water. Avoid excesses and condiments.

INFLAMMATORY SORE THROAT—Leeches and blisters externally, aperients No. 1, followed by number 7; gargle to clear the throat, No. 17. Avoid cold, damp, and draughts.

INFLAMED EYES—The bowels to be regulated by No. 5, drop 5% cocaine solution in the eye every three or four hours, the eye to be bathed with No. 35.

INFLUENZA—No. 4 as an aperient and diaphoretic. No. 14 to allay fever and cough. No. 28 as a tonic, when weakness only remains. Avoid cold and damp, use clothing suited to the changes of temperature.

INTERMITTENT FEVER, OR AGUE—Take No. 13 during the intermission of the paroxysm of the fever; keeping the bowels free with a wine glass of No. 7. Avoid bad air, stagnant pools, etc.

ITCH—The ointment No. 28, or lotion No. 29.

JAUNDICE—The pills No. 1, afterwards the mixture No. 7, drinking freely of dandelion tea.

LOOSENESS OF THE BOWELS (ENGLISH CHOLERA)—One pill No. 19, repeated if necessary; afterwards the mixture No. 21. Avoid unripe fruits, acid drinks, ginger beer; wrap flannel around the abdomen.

MEASLES—A well-ventilated room, aperients No. 4, with No. 14 to allay the cough and fever.

MENSTRUATION (EXCESSIVE)—No. 40 during the attack, with rest in the recumbent position; in the intervals, No. 39.

MENSTRUATION (SCANTY)—In strong patients, cupping the loins, exercise in the open air, No. 40, the feet in warm water before the expected period, the pills No. 38; in weak subjects No. 39. Gentle and regular exercise. Avoid hot rooms, and too much sleep. In cases of this description it is desirable to apply to a medical man for advice. It may be useful to many to point out that pennyroyal tea is a simple and useful medicine for inducing the desired result.

MENSTRUATION (PAINFUL)—No. 41 during the attack; in the intervals, No. 38 twice a week, with No. 39. Avoid cold, mental excitement, etc.

MUMPS—Fomentation with a decoction of camomiles and poppy heads; No. 4 as an aperient, and No. 9 during the stage of fever. Avoid cold, and attend to the regularity of the bowels.

NERVOUSNESS—Cheerful society, early rising, exercise in the open air, particularly on horseback, and No. 12. Avoid excitement, study, and late meals.

PALPITATION OF THE HEART—The pills No. 2, with the mixture No. 12.

PILES—The paste No. 34, at the same time a regulated diet. When the piles are external, or can be reached, one or two applications of Goulard's extract, with an occasional dose of lenitive electuary, will generally succeed in curing them.

QUINSY—A blister applied all around the throat; an emetic, No. 16, commonly succeeds in breaking the abscess; afterwards the gargle No. 17. Avoid cold and damp.

RHEUMATISM—Bathe the affected parts with No. 23, and take internally No. 24, with No. 25 at bedtime, to ease pain, etc. Avoid damp and cold, wear flannel.

RICKETS—The powder No. 33, a dry, pure atmosphere, a nourishing diet.

RINGWORM—The lotion No. 32, with the occasional use of the powder No. 5. Fresh air and cleanliness.

SCARLET FEVER—Well-ventilated room, sponging the body when hot with cold or tepid vinegar, or spirit and water; aperients, No. 4; diaphoretics, No. 8. If dropsy succeed the disappearance of the eruption, frequent purging with No. 5, succeeded by No. 7.

SCROFULA—Pure air, light but warm clothing, diet of fresh animal food; bowels to be regulated by No. 6 and No. 26, taken regularly for a considerable time.

SCURVY—Fresh animal and vegetable food, and the free use of ripe fruits and lemon juice. Avoid cold and damp.

SMALLPOX—A well-ventilated apartment, mild aperients; if fever be present, No. 7, succeeded by diaphoretics No. 8, and tonics No. 13 in the stage of debility, or decline of the eruption.

ST. VITUS DANCE—The occasional use, in the commencement, of No. 5, followed by No. 7, afterwards No. 46.

THRUSH—One of the powders No. 6 every other night; in the intervals a dessertspoonful of the mixture No. 18 three times a day; white spots to be dressed with the honey of borax.

TIC DOLOREUX—Regulate the bowels with No. 3, and take, in the intervals of pain, No. 27. Avoid cold, damp, and mental anxiety.

TOOTHACHE—Continue the use of No. 3 for a few alternate days. Apply liquor ammoniæ to reduce the pain, and when that is accomplished, fill the decayed spots with silver succedaneum without delay, or the pain will return. A drop of creosote, or a few drops of chloroform on cotton, applied to the tooth, or a few grains of camphor placed in the decayed opening, or camphor moistened with turpentine, will often afford instant relief.

TYPHUS FEVER—Sponging the body with cold or tepid water, a well-ventilated apartment, cold applications to the head and temples. Aperients No. 4, with refrigerants No. 9, tonics No. 13 in the stage of debility.

WATER ON THE BRAIN—Local bleeding by means of leeches, blisters, aperients No. 5, and mercurial medicines, No. 15.

WHITES—The mixture No. 36, with the injection No. 37. Clothing light but warm, moderate exercise in the open air, country residence.

WORMS IN THE INTESTINES—The aperient No. 5, followed by No. 7, afterwards the free use of lime water and milk in equal parts, a pint daily. Avoid unwholesome food.

PRESCRIPTIONS.

To be used in the cases enumerated under the head "Diseases" (pages 312–315.)

The following prescriptions, originally derived from various prescribers' Pharmacopœias, and now carefully revised, embody the favorite remedies employed by the most eminent physicians:

1. Take of powdered aloes, nine grains; extract of colocynth, compound, eighteen grains; calomel, nine grains; tartrate of antimony, two grains; mucilage, sufficient to make a mass, which is divided into six pills; two to be taken every twenty-four hours, till they act thoroughly on the bowels; in cases of inflammation, apoplexy, etc.

2. Powdered rhubarb, Socotrine aloes, and gum mastic, each one scruple; make into twelve pills; one before and one after dinner.

3. Compound extract of colocynth, extract of jalap, and Castile soap, of each one scruple; make into twelve pills.

4. James' powder, five grains; calomel, three grains, in fevers, for adults. For children, the following: Powdered camphor, one scruple: calomel and powdered scammony, of each nine grains; James' powder, six grains; mix, and divide into six powders. Half of one powder twice a day for an infant a year old; a whole powder for two years; and for four years, the same three times a day.

5. James' powder, six grains; powdered jalap, ten grains, mix, and divide into three or four powders, according to the child's age: in one powder if for an adult.

6. Powdered rhubarb, four grains; mercury and chalk, three grains; ginger in powder, one grain; an alterative aperient for children.

7. Fluid extract cascara, six drams; tincture aloes four drams; tincture hyoscyamus, four drams; neutralizing cordial, two ounces; dessertspoonful every four hours until the bowels move freely.

8. Nitrate of potass, one dram and a half; spirits of nitric ether, half an ounce; camphor mixture, and the spirit of mindererus, each four ounces; in fevers, etc.; two tablespoonfuls, three times a day, and for children a dessertspoonful every four hours.

9. Spirit of nitric ether, three drams; dilute nitric acid, two drams; syrup, three drams; camphor mixture, seven ounces; in fevers, etc., with debility; dose as in preceding prescription.

10. Decoction of broom, half a pint; cream of tartar, one ounce; tincture of squills, two drams; in dropsies; a third part three times a day.

11. Pills of soap and opium, five grains for a dose, as directed.

12. Ammoniated tincture of valerian, six drams; camphor mixture, seven ounces; a fourth part three times a day; in spasmodic and hysterical disorders.

13. Bisulphate of quinia, half a dram; dilute sulphuric acid, twenty drops; compound infusion of roses, eight ounces; two tablespoonfuls every four hours, in intermittent and other fevers, during the absence of the paroxysm.

14. Almond mixture, seven ounces and a half; wine of antimony and ipecacuanha, of each one dram and a half; a tablespoonful every four hours; in cough with fever, etc.

15. Calomel, one grain, powdered white sugar, two grains; to make a powder to be placed on the tongue every two or three hours. Should the calomel act on the bowels, powdered kino is to be substituted for the sugar.

16. Antimony and ipecacuanha wines, of each an ounce; a teaspoonful every ten minutes for a child till vomiting is produced; but for an adult a large tablespoonful should be taken.

17. Compound infusion of roses, seven ounces; tincture of myrrh, one ounce.

18. Infusion of orange peel, seven ounces; tincture of hops, half an ounce; and a dram of carbonate of soda; two tablespoonfuls twice a day. Or infusion of valerian, seven ounces; carbonate of ammonia, two scruples; compound tincture of bark, six drams; spirits of ether, two drams; one tablespoonful every twenty-four hours.

19. Blue pill, four grains; opium, half a grain; to be taken three times a day.

20. For a Clyster—A pint and a half of gruel or fat broth, a tablespoonful of castor oil, one of common salt, and a lump of butter; mix, to be injected slowly. A third of this quantity is enough for an infant.

21. Chalk mixture, seven ounces; aromatic and opiate confection, of each one dram: tincture of catechu, six drams; two tablespoonfuls every two hours.

22. Carbonate of soda, powdered rhubarb, and Castile soap, each one dram; make thirty-six pills; three twice a day.

23. Lotion—Common salt, one ounce; distilled water, seven ounces; spirits of wine, one ounce; mix.

24. Dried sulphate of magnesia, six drams; heavy carbonate of magnesia, two drams; wine of colchicum, two drams; water, eight ounces; take two tablespoonfuls every four hours.

25. Compound powder of ipecacuanha, ten grains; powdered guaiacum, four grains; in a powder at bedtime.

26. Brandish's solution of potash; thirty drops twice a day in a wineglass of beer.

27. Bisulphate of quinia, half a dram; dilute sulphuric acid, ten drops; compound infusion of roses, eight ounces; two tablespoonfuls every eight hours, and as a tonic in the stage of weakness succeeding fever.

28. Flowers of sulphur, two ounces; hog's lard, four ounces; white hellebore powder, half an ounce; oil of lavender, sixty drops.

29. Iodide of potass, two drams; distilled water, eight ounces.

30. Flowers of sulphur, half a dram; carbonate of soda, a scruple; tartarized antimony, one-eighth of a grain; one powder night and morning, in eruptions of the skin or face.

31. Milk of bitter almonds, seven ounces; bichloride of mercury, four grains; spirits of rosemary, one ounce; bathe the eruption with this lotion three times a day.

32. Sulphate of zinc, two scruples; sugar of lead, fifteen grains; distilled water, six ounces; the parts to be washed with the lotion three times a day.

33. Carbonate of iron, six grains; powdered rhubarb, four grains; one powder night and morning.

34. Aromatic powder and pepsin, each one dram; make twelve powders; one three or four times a day.

35. Sulphate of zinc, twelve grains; wine of opium, one dram; rosewater, six ounces.

36. Sulphate of magnesia, six drams; sulphate of iron, ten grains; diluted sulphuric acid, forty drops; tincture of cardamoms (compound), half an ounce; water, seven ounces; a fourth part night and morning.

37. Decoction of oak bark, a pint; dried alum, half an ounce; for an injection; a syringe full to be used night and morning.

38. Compound gamboge pill and a pill of asafœtida and aloes; of each half a dram; make twelve pills; two twice or three times a week.

39. Griffith's mixture—one tablespoonful three times a day.

40. Ergot of rye, five grains; in a powder, to be taken every four hours. This should only be taken under medical advice and sanction.

41. Powdered opium, half a grain; camphor, two grains, in a pill; to be taken every three or four hours whilst in pain.

42. Syrup of balsam of tolu, two ounces; the muriate of morphia, two grains; muriatic acid, twenty drops; a teaspoonful twice a day.

43. Salts of tartar, two scruples; twenty grains of powdered cochineal; ¼ lb of honey; water, half a pint; boil and give a tablespoonful three times a day.

44. Calomel, ten grains; Castile soap, extract of jalap, extract of colocynth, of each one scruple; oil of juniper, five drops; make into fifteen pills; one three times a day.

45. Infusion of orange peel, eight ounces; carbonate of soda, one dram; and compound tincture of cardamoms, half an ounce; take a tablespoonful three times a day succeeding the pills.

46. Carbonate of iron, three ounces; syrup of ginger sufficient to make an electuary; a teaspoonful three times a day.

47. Take of Castile soap, compound extract of colocynth, compound rhubarb pill and the extract of jalap, each one scruple; oil of caraway, ten drops; make into twenty pills, and take one after dinner every day whilst necessary.

48. Spirit of rosemary, five parts; spirit of wine, or spirit of turpentine, one part.

49. Take of thick mucilage, one ounce; castor oil, twelve drams; make into an emulsion; add mint water, four ounces; spirit of nitre, three drams; laudanum, one dram; mixture of squills, one dram; and syrup, seven drams; mix; two tablespoonfuls every six hours.

Rules for the Preservation of Health.

PURE ATMOSPHERIC AIR is composed of nitrogen, oxygen and a very small proportion of carbonic acid gas. Air once breathed has lost the chief part of its oxygen and acquired a proportionate increase of carbonic acid gas. Therefore, health requires that we breathe the same air once only.

THE SOLID PART OF OUR BODIES is continually wasting and requires to be repaired by fresh substances. Therefore, food which is to repair the loss should be taken with due regard to the exercise and waste of the body.

THE FLUID PART OF OUR BODIES also wastes constantly; there is but one fluid in animals, which is water. Therefore, water only is necessary, and no artifice can produce a better drink.

THE FLUID OF OUR BODIES is to the solid in proportion as nine to one. Therefore, a like proportion should prevail in the total amount of food taken.

LIGHT EXERCISES AN IMPORTANT INFLUENCE upon the growth and vigor of animals and plants. Therefore, our dwellings should freely admit the solar rays.

DECOMPOSING ANIMAL AND VEGETABLE SUBSTANCES yield various noxious gases which enter the lungs and corrupt the blood. Therefore, all impurities should be kept away from our abodes, and every precaution be observed to secure a pure atmosphere.

WARMTH IS ESSENTIAL to all the bodily functions. Therefore, an equal bodily temperature should be maintained by exercise, by clothing or by fire.

EXERCISE WARMS, INVIGORATES and purifies the body; clothing preserves the warmth the body generates; fire imparts warmth externally. Therefore, to obtain and preserve warmth, exercise and clothing are preferable to fire.

MENTAL AND BODILY EXERCISE are equally essential to the general health and happiness. Therefore, labor and study should succeed each other.

MAN WILL LIVE MOST HEALTHILY upon simple solids and fluids, of which a sufficient but temperate quantity should be taken. Therefore, over-indulgence in strong drinks, tobacco, snuff, opium, and all mere indulgences, should be avoided.

SUDDEN ALTERNATIONS OF HEAT AND COLD are dangerous (especially to the young and the aged). Therefore, clothing, in quality and quantity, should be adapted to the alternations of night and day and of the seasons; and drinking cold water when the body is hot, and hot tea and soups when cold, are productive of many evils.

THE SKIN IS A HIGHLY ORGANIZED MEMBRANE full of minute pores, cells, blood vessels and nerves: it imbibes moisture or throws it off, according to the state of the atmosphere and the temperature of the body. It also "breathes," as do the lungs (though less actively). All the internal organs sympathize with the skin. Therefore, it should be repeatedly cleansed.

FIRE CONSUMES THE OXYGEN of the air and produces noxious gases. Therefore, the air is less pure in the presence of candles, gas or coal fire, than otherwise, and the deterioration should be repaired by increased ventilation.

LATE HOURS AND ANXIOUS PURSUITS exhaust the nervous system and produce disease and premature death. Therefore, the hours of labor and study should be short.

MODERATION IN EATING and drinking, short hours of labor and study, regularity in exercise, recreation and rest, cleanliness, equanimity of temper and equality of temperature—these are the great essentials to that which surpasses all wealth, health of mind and body.

HOMŒOPATHY.

PRINCIPLES OF HOMŒOPATHY:—As homœopathy is now practiced so widely, and, indeed, preferred to the older system in many families, this department could scarcely lay claim to be considered complete without a brief mention of the principal remedies used and recommended by homœopathic practitioners, and the disorders for which these remedies are especially applicable. The principle of homœopathy is set forth in the Latin words "*similia similibus curantur*," the meaning of which is "likes are cured by likes." The homœopathist, in order to cure a disease, administers a medicine which would produce in a perfectly healthy subject symptoms *like* but not *identical* with, or the *same* as, the symptoms to counteract which the medicine is given. He, therefore, first makes himself thoroughly acquainted with the symptoms that are exhibited by the sufferer; having ascertained these, in order to neutralize them and restore the state of the patient's health to a state of equilibrium, so to speak, he administers preparations that would produce symptoms of a like character in persons in good health. It is not said, be it remembered, that the drug can produce in a healthy person the disease from which the patient is suffering; it is only advanced by homœopathists that the drug given has the power of producing in a person in health symptoms similar to those of the disease under which the patient is languishing, and that the correct mode of treatment is to counteract the disease symptoms by the artificial production of similar symptoms by medical means, or, in other words, to suit the medicine to the disorder, by the previously acquired knowledge of the effects of the drug by experiment on a healthy person.

HOMŒOPATHIC REMEDIES are given in the form of globules or tinctures, the latter being generally preferred by homœopathic practitioners. When contrasted with the doses of drugs given by allopathists, the small doses administered by homœopathists

must at first sight appear wholly inadequate to the purpose for which they are given; but homœopathists, whose dilution and trituration diffuse the drug given throughout the vehicle in which it is administered, argue that by this *extension of its surface* the active power of the drug is greatly increased. Large doses of certain drugs administered for certain purposes will pass through the system without in any way affecting those organs which will be acted on most powerfully by the very same drugs when administered in much smaller doses. Thus a small dose of sweet spirit of nitre will act on the skin and promote perspiration, but a large dose will act as a diuretic only and exert no influence on the skin.

Great stress is laid by homœopathists on attention to diet, but not so much so in the present day as when the system was first introduced. The reader will find a list of articles of food that may and may not be taken in a succeeding page. Below are given briefly a few of the more common ailments "that flesh is heir to," with the symptoms by which they are indicated and the medicines by which they may be alleviated and eventually cured.

ASTHMA, an ailment which should be referred in all cases to the medical practitioner. *Symptoms.* Difficulty in breathing, with cough, either spasmodic and without expectoration, or accompanied with much expectoration. *Medicines.* Aconitum napellus, especially with congestion or slight spitting of blood; Antimonium tartaricum for rattling and wheezing in the chest; Arsenicum for chronic asthma; Ipecacuanha; Nux vomica.

BILIOUS ATTACKS, if attended with diarrhœa and copious evacuations of a bright yellow color. *Medicines.* Bryonia, if arising from sedentary occupation, or from eating and drinking too freely; or Nux vomica and Mercurius in alternation, the former correcting constipation and the latter nausea, fullness at the pit of the stomach and a foul tongue.

BRONCHITIS. *Symptoms.* Catarrh, accompanied with fever; expectoration, dark, thick, and sometimes streaked with blood; urine dark, thick and scanty. *Medicines.* Aconitum napellus; especially in earlier stages; Bryonia for pain in coughing and difficulty in breathing; Antimonium tartaricum, loose cough, with much expectoration, and a feeling of, and tendency to, suffocation; ipecacuanha, accumulation of phlegm in bronchial tubes and for children.

BRUISES AND WOUNDS.—For all bruises, black eyes, etc., apply Arnica lotion; for slight wounds, after washing well with cold water, apply Arnica plaster; to stop bleeding, when ordinary means fail, and for larger wounds apply concentrated tincture of Calendula.

COLD IN THE HEAD OR CATARRH. *Symptoms.* Feverish feeling generally, and especially about the head, eyes, and nose, running from, and obstruction of nose; soreness and irritation of the throat and bronchial tubes. *Medicines.* Aconitum napellus for feverish symptoms; Belladonna for sore throat and headache with inclination to cough; Mercurius for running from nose and sneezing; Nux vomica for stoppage of nostrils; Chamomilla for children and women, for whom Pulsatilla is also useful in such cases.

CHILBLAINS. *Symptoms.* Irritation and itching of the skin, which assumes a bluish red color. *Medicines.* Arnica montana, taken internally or used as outward application, unless the chilblain be broken, when Arsenicum should be used. If the swelling and irritation do not yield to these remedies, use Belladona and Rhus toxicodendron.

CHOLERA. 1. Bilious cholera. *Symptoms.* Nausea, proceeding to vomiting, griping of the bowels, watery and offensive evacuations, in which much bile is present, accompanied with weakness and depression. *Medicines.* Bryonia, with ipecacuanha at commencement of attack. 2. Malignant or Asiatic cholera. *Symptoms* as in bilious cholera, but in a more aggravated form, followed by what is called the "cold stage," marked by great severity of griping pain in stomach accompanied with frequent and copious watery evacuations, and presently with cramps in all parts of the body; after which the extremities become chilled, the pulse scarcely discernible, the result of which is stupor and ultimately death. *Medicines.* Camphor in the form of tincture, in frequent doses, until the sufferer begins to feel warmth returning to the body, and perspiration ensues. In the latter stages, Cuprum and Veratrum.

TINCTURE OF CAMPHOR is one of the most useful of the homœopathic remedies in all cases of colic, diarrhœa, etc. In ordinary cases fifteen drops on sugar may be taken every quarter of an hour until the pain is allayed. In more aggravated cases, and in cases of cholera, a few drops may be taken at intervals of from two to five minutes. A dose of fifteen drops of camphor on sugar tends to counteract a chill if taken soon after premonitory symptoms show themselves, and act as a prophylactic against cold.

COLIC OR STOMACH ACHE.—This disorder is indicated by griping pains in the bowels, which sometimes extend upwards into and over the region of the chest. Sometimes the pain is attended with vomiting and cold perspiration. A warm bath is useful, and hot flannels, or a jar or bottle filled with hot water should be applied to the abdomen. *Medicines.* Aconitum napellus, especially when the abdomen is tender to the touch, and the patient is feverish; Belladonna for severe griping and spasmodic pains; Bryonia for bilious colic and diarrhœa; Chamomilla for children.

CONSTIPATION.—Women are more subject than men to this confined state of the bowels, which will, in many cases, yield to exercise, plain, nutritious diet, with vegetables and cooked fruit, and but little bread, and an enema of milk and water, or thin gruel if it is some time since there has been any action of the bowels. *Medicines.* Bryonia, especially for rheumatic patients, and disturbed state of the stomach; Nux vomica, for persons of sedentary habits, especially males; Pulsatilla, for women; Sulphur, for constipation that is habitual or of long continuance.

CONVULSIONS.—For convulsions arising from whatever cause, a warm bath is desirable, and a milk and water enema, if the child's bowels are confined. *Medicines.* Belladonna and Chamomilla, if the convulsions are caused by teething, with Aconitum napellus if the little patient be feverish; Aconitum napellus, Cina, and Belladonna, for convulsions caused by worms; Aconite and Coffœa, when they arise from fright; Ipecacuanha and Nux vomica, when they have been caused by repletion, or food that is difficult of digestion.

COUGH.—For this disorder, a light farinaceous diet is desirable, with plenty of out-door exercise and constant use of the sponging-bath. *Medicines.* Aconitum napellus, for a hard, dry, hacking cough; Antimonium, for cough with wheezing and difficulty of expectoration; Belladonna, for spasmodic cough, with tickling in the throat, or sore throat; Bryonia, for hard, dry cough, with expectorations streaked with blood; ipecacuanha, for children.

CROUP.—As this disorder frequently and quickly terminates fatally, recourse should be had to a duly qualified practitioner as soon as possible. The disease lies chiefly in the larynx and bronchial tubes, and is easy recognizable by the sharp, barking sound of the cough. A warm bath and mustard poultice will often tend to give relief. *Medicines.* Aconitum napellus, in the earlier stages of the disorder, and Spongia and Hepar sulphuris, in the more advanced stages, the latter medicine being desirable when the cough is not so violent and the breathing easier.

DIARRHŒA.—The *medicines* to be used in this disorder are those which are mentioned under colic and bilious attacks.

DYSENTERY is somewhat similar to diarrhœa, but the symp-

toms are more aggravated in character, and the evacuations are chiefly mucus streaked with blood. As a local remedy hot flannels or a stone jar filled with hot water and wrapped in flannel should be applied to the abdomen. *Medicines.* Colocynthis and Mercurius in alternation.

DYSPEPSIA OR INDIGESTION arises from weakness of the digestive organs. *Symptoms.* Chief among these are habitual costiveness, heartburn and nausea, disinclination to eat, listlessness and weakness, accompanied with fatigue after walking etc., restlessness and disturbed sleep at night, bad taste in the mouth, with white tongue, especially in the morning, accompanied at times with fullness in the region of the stomach, and flatulence, which causes disturbance of the heart. The causes of indigestion are too numerous to be mentioned here, but they may be inferred when it is said that scrupulous attention must be paid to diet (see *p.* 324); that meals should be taken at regular and not too long intervals; that warm drinks, stimulants and tobacco should be avoided; that early and regular hours should be kept, with a cold or chilled sponge bath every morning; and that measures should be taken to obtain a fair amount of exercise, and to provide suitable occupation for both body and mind during the day. *Medicines.* Arnica montana for persons who are nervous and irritable, and suffer much from headache; Bryonia for persons who are bilious and subject to rheumatism, and those who are listless and disinclined to eat, and have an unpleasant bitter taste in the mouth; Hepar sulphuris for chronic indigestion and costiveness, attended with tendency to vomit in the morning; Mercurius in cases of flatulence, combined with costiveness; Nux vomica for indigestion that makes itself felt from 2 a. m. to 4 a. m., or thereabouts, with loss of appetite and nausea in the morning, and for persons with a tendency to piles, and those who are engaged in sedentary occupations; Pulsatilla for women generally, and Chamomilla for children.

FEVERS.—For all fevers of a serious character, such as scarlet fever, typhus fever, typhoid fever, gastric fever, intermittent fever, or ague, etc., it is better to send at once for a medical man. In cases of ordinary fever, indicated by alternate flushes and shivering, a hot dry skin, rapid pulse, and dry, foul tongue, the patient should have a warm bath, take but little nourishment, and drink cold water. *Medicine.* Aconitum napellus.

FLATULENCY.—This disorder, which arises from, and is a symptom of indigestion, frequently affects respiration, and causes disturbance and quickened action of the heart. The patient should pay attention to diet, as for dyspepsia. *Medicines.* Cina and Nux vomica; Pulsatilla for women, and Chamomilla for children. See DYSPEPSIA.

HEADACHE.—This disorder proceeds from so many various causes, which require different treatment, that it is wiser to apply at once to a regular homœopathic practitioner, and especially in headache of frequent occurrence. *Medicines.* Nux vomica when headache is caused by indigestion; Pulsatilla being useful for women: Belladonna and Ignatia, for sick headache; Aconitum napellus and Arsenicum for nervous headache.

HEARTBURN.—For this unpleasant sensation of heat, arising from the stomach, accompanied by a bitter taste, and sometimes by nausea, Nux vomica is a good medicine. Pulsatilla may be taken by women.

INDIGESTION.—See *Dyspepsia.*

MEASLES.—This complaint, which seldom attacks adults, is indicated in its early stage by the usual accompaniments and signs of a severe cold in the head—namely, sneezing, running from the nose and eyelids, which are swollen. The sufferer also coughs, does not care to eat, and feels sick and restless. About four days after the first appearance of these premonitory symptoms, a red rash comes out over the face, neck and body, which dies away, and finally disappears in about five days. The patient should be kept warm, and remain in one room during the continuance of the disorder, and especially while the rash is out, lest, through exposure to cold in any way, the rash may be checked and driven inwards. *Medicines.* Aconitum napellus, and Pulsatilla, which are sufficient for all ordinary cases. If there be much fever, Belladonna; and if the rash be driven in by a chill, Bryonia.

MUMPS.—This disorder is sometimes consequent on measles. It is indicated by the swelling of the glands under the ear and lower jaw. It is far more painful than dangerous. Fomenting with warm water is useful. *Medicines.* Mercurius generally; Belladonna may be used when mumps follow an attack of measles.

NETTLERASH.—This rash, so called because in appearance it resembles the swelling and redness caused by the sting of a nettle, is generally produced by a disordered state of the stomach. *Medicines.* Aconitum napellus, Nux-vomica, or Pulsatilla, in ordinary cases; Arsenicum is useful if there is much fever; Belladonna if the rash is accompanied with headache.

PILES.—The ordinary homœopathic remedies for this painful complaint are Nux vomica and Sulphur.

SPRAINS.—Apply to the part affected a lotion of one part of tincture of Arnica to two of water. For persons who cannot use Arnica, in consequence of the irritation produced by it, a lotion of tincture of Calendula may be used in the proportion of one part of the tincture to four of water.

TEETHING.—Infants and very young children frequently experience much pain in the mouth during dentition, and especially when the tooth is making its way through the gum. The child is often feverish, the mouth and gums hot and tender, and the face flushed. There is also much running from the mouth, and the bowels are disturbed, being in some cases confined, and in others relaxed, approaching to diarrhœa. *Medicines.* These are Aconitum napellus, in ordinary cases; Nux vomica, when the bowels are confined; Chamomilla, when the bowels are relaxed; Mercurius, if the relaxed state of the bowels has deepened into diarrhœa; Belladonna, if there be symptoms of disturbance of the brain.

WHOOPING COUGH.—This disease is sometimes of long duration, for if it shows itself in the autumn or winter months, the little patient will frequently retain cough until May or even June, when it disappears with return of warmer weather. Change of air when practicable is desirable, especially when the cough has been of long continuance. In this cough there are three stages. In the first the symptoms are those of an ordinary cold in the head and cough. In the second the cough becomes hard, dry and rapid, and the inhalation of the air, after or during the paroxysm of the coughing, produces a peculiar sound from which the disease is named. In the final stage the cough occurs at longer intervals, and the paroxysms are less violent and ultimately disappear. In this stage the disease is subject to fluctuation, the cough again increasing in frequency of occurrence and intensity if the patient has been unduly exposed to cold or damp, or if the weather is very changeable. Children suffering from whooping-cough should have a light nourishing diet and only go out when the weather is mild and warm. *Medicines.* Aconitum napellus in the very commencement of the disorder, followed by Ipecacuanha and Nux vomica when the second stage is just approaching and during its continuance. These medicines may be continued if necessary during the third stage.

WORMS.—The presence of worms is indicated by irritation of the membrane of the nose, causing the child to thrust its finger into the nostrils; by irritation of the lower part of the body; by thinness, excessive appetite and restlessness in sleep. Children suffering from worms should eat meat freely and not take so much bread, vegetables, and farinaceous food as children generally do. They should have as much exercise as possible in the open air, and be sponged with cold water every morning. The worms that mostly trouble children are the thread worms, which are present chiefly in the lower portion of the intestines, and the round worm. *Medicine, &c.* Administer an injection of weak salt-and-water, and give Aconitum napellus, to be followed by Ignatia and Sulphur in the order in which they are here given. These are the usual remedies for thread worms. For round worms, whose presence in the stomach is indicated by great thinness, sickness and discomfort, and pain in the stomach, Aconitum napellus, Cina, Ignatia, and Sulphur are given.

EXTENT OF DOSES IN HOMŒOPATHY.—Homœopathic medicines are given in the form of globules, pilules, or tincture, the last-named being

generally preferred. The average doses for adults are from half a drop to one drop of the tincture given in a tablespoonful of water, from two to four pilules, or from three to six globules. In using the tincture it is usual to measure out a few tablespoonfuls of water and to add to it a certain number of drops regulated by the quantity of water that is used. For children medicine is mixed at the same strength, but a less quantity is given. The proper quantity for a dose is always given in books and manuals for the homœopathic treatment of disease. Small cases of the principal medicines used in homœopathy can be procured from most druggists, and with each case a little book showing the symptoms and treatment of all ordinary complaints is usually given.

DIET IN HOMŒOPATHY.—The articles of food that are chiefly recommended when attention to diet is necessary are stale bread, beef, mutton, poultry, fresh game, fish, chiefly cod and flat fish, avoiding mackerel, etc., eggs and oysters. Rice, sago, tapioca, and arrowroot are permitted, as are also potatoes, carrots, turnips, broccoli, cauliflower, asparagus, French beans, and broad beans. Water, milk, cocoa and chocolate may be drunk. It is desirable to avoid all things that are not specified in the foregoing list. Ripe fruit may be eaten, but unripe fruit, unless cooked, should be scrupulously avoided.

ARTIFICIAL FEEDING OF INFANTS.

The following formula, by a physician of high standing, has been found beneficial in numerous cases where everything else failed to produce satisfactory results. In the author's own family, it saved the life of an infant daughter who had been given up by an old practitioner, but who, it seems, was dying simply from lack of proper nourishment. She is now a rosy, robust child, in perfect health, and the pet of the household. The virtue of this formula consists in the fact that it most nearly corresponds to the natural nourishment from a healthy mother's breast. In using this formula care should be taken to use only absolutely pure water, and all bottles and vessels should be scrupulously clean. The cream and milk should be from *one* cow only:

Take two tablespoonfuls of cream, two tablespoonfuls of lime water, one tablespoonful of good milk, three tablespoonfuls of a solution of sugar of milk containing eighteen drams to one pint of pure water.

This quantity warmed is enough for once feeding a child of four months. For an older child add one teaspoonful of milk to the mixture for each month over four. For a younger child, diminish the quantity of milk in the same ratio.

The child should be fed every two hours and a half during the day and evening and as little as possible at night.

If the child be constipated, substitute barley water for lime water. In preparing the barley water a porcelain-lined kettle should be employed if possible. Use best pearl barley, and boil to a very thin gruel, which strain.

Each feeding must, of course, be made fresh, although the barley water and the sugar-of-milk solution may be made in quantities.

CHOLERA MIXTURE—Take equal parts of tincture of cayenne, tincture of opium, tincture of rhubarb, essence of peppermint, and spirits of camphor. Mix well. Dose, 15 to 30 drops in a wine-glass of water, according to age and violence of the attack. Repeat every fifteen or twenty minutes until relief is obtained.

CURE FOR HICCOUGH—Sit erect and inflate the lungs fully. Then, retaining the breath, bend forward slowly until the chest

meets the knees. After slowly arising again to the erect position, slowly exhale the breath. Repeat this process a second time, and the nerves will be found to have received an access of energy that will enable them to perform their natural functions.

CHOKING—A piece of food lodged in the throat may sometimes be pushed down with the finger, or removed with a hairpin quickly straightened and hooked at the end, or by two or three vigorous blows on the back between the shoulders.

Contagious Diseases.

The following points will help to determine the nature of a suspicious illness:

DISEASE.	Rash or Eruption.	Appearance.	Durati'n in days.	Remarks.
CHICKEN-POX	Small rose pimples changing to vesicles	2d day of fever or after 24 h'rs' illness.	6–7	Scabs from about fourth day of fever.
ERYSIPELAS	Diffuse redness and swelling	2d or 3d day of illness.		
MEASLES	Small red dots like flea bites	4th day of fever or after 72 hours' illness.	6–10	Rash fades on 7th day.
SCARLET FEVER.	Bright scarlet, diffused	2d day of fever or after 24 hours' illness.	8–10	Rash fades on 5th day.
SMALL-POX	Small red pimples changing to vesicles, then pustules	3d day of fever or after 48 hours' illness.	14–21	Scabs form 9th or 10th day, fall off about 14th.
TYPHOID FEVER.	Rose-colored spots scattered	11th to 14th day.	22–30	Accompanied by diarrhœa.

It will often relieve a mother's anxiety to know how long there is danger of infection after a child has been exposed to a contagious disease. The following table gives the information concerning the more important diseases:

DISEASE.	Symptoms appear.	Period ranges from	Patient is Infectious.
CHICKEN-POX	On 14th day	10–18 days	Until all scabs have fallen off.
DIPHTHERIA	" 2d day	2– 5 days	14 d's after dis'pear'ce of membrane.
MEASLES*	" 14th day	10–14 days	Until scali'g and cough have ceas'd.
MUMPS	" 19th day	16–24 days	14 days from commencement.
ROTHELN	" 14th day	12–20 days	10–14 days from commencement.
SCARLET FEVER	" 4th day	1– 7 days	Until all scaling has ceased.
SMALL-POX	" 12th day	1–14 days	Until all scabs have fallen off.
TYPHOID FEVER	" 21st day	1–28 days	Until diarrhœa ceases.
WHOOPING COUGH†	" 14th day	7–14 days	Six weeks from beginning to whoop.

*In measles the patient is infectious three days before the eruption appears.

†In whooping-cough the patient is infectious during the primary cough, which may be three weeks before the whooping begins.

ACCIDENTS AND EMERGENCIES.

WHAT TO DO.

If an artery is cut, red blood spurts. Compress it above the wound. If a vein is cut, dark blood flows. Compress it below and above.

If choked, go upon all fours and cough.

For slight burns, dip the part in cold water; if the skin is destroyed, cover with varnish or linseed oil.

For apoplexy, raise the head and body; for fainting, lay the person flat.

Send for a physician when a serious accident of any kind occurs, but treat as directed until he arrives.

SCALDS AND BURNS—The following facts cannot be too firmly impressed on the mind of the reader, that in either of these accidents the *first, best,* and *often the only remedies required,* are sheets of wadding, fine wool, or carded cotton, and in the default of these, violet powder, flour, magnesia, or chalk. The object for which these several articles are employed is the same in each instance; namely, to exclude the air from the injured part; for if the air can be effectually shut out from the raw surface, and care is taken not to expose the tender part till the new cuticle is formed, the cure may be safely left to nature. The moment a person is called to a case of scald or burn, he should cover the part with a sheet, or a portion of a sheet, of wadding, taking care not to break any blister that may have formed, or stay to remove any burnt clothes that may adhere to the surface, but as quickly as possible envelop every part of the injury from all access of the air, laying one or two more pieces of wadding on the first, so as effectually to guard the burn or scald from the irritation of the atmosphere; and if the article used is wool or cotton, the same precaution, of adding more material where the surface is thinly covered, must be adopted; a light bandage finally securing all in their places. Any of the popular remedies recommended below may be employed when neither wool, cotton, nor wadding are to be procured, it being always remembered that that article which will best exclude the air from a burn or scald is the best, quickest, and least painful mode of treatment. And in this respect nothing has surpassed cotton loose or attached to paper as in wadding.

If the Skin is Much Injured in burns, spread some linen pretty thickly with chalk ointment, and lay over the part, and give the patient some brandy and water if much exhausted; then send for a medical man. If not much injured, and very painful, use the same ointment, or apply carded cotton dipped in lime water and linseed oil. If you please, you may lay cloths dipped in ether over the parts, or cold lotions. Treat scalds in same manner, or cover with scraped raw potato; but the chalk ointment is the best. In the absence of all these, cover the injured part with treacle, and dust over it plenty of flour.

BODY IN FLAMES—Lay the person down on the floor of the room, and throw the table cloth, rug, or other large cloth over him, and roll him on the floor.

DIRT IN THE EYE—Place your forefinger upon the cheek-bone, having the patient before you; then slightly bend the finger, this will draw down the lower lid of the eye, and you will probably be able to remove the dirt; but if this will not enable you to get at it, repeat this operation while you have a netting-needle or bodkin placed over the eyelid; this will turn it inside out, and enable you to remove the sand, or eyelash, etc., with the corner of a fine silk handkerchief. As soon as the substance is removed, bathe the eye with cold water, and exclude the light for a day. If the inflammation is severe, let the patient use a refrigerant lotion.

LIME IN THE EYE—Syringe it well with warm vinegar and water in the proprotion of one ounce of vinegar to eight ounces of water; exclude light.

IRON OR STEEL SPICULÆ IN THE EYE—These occur while turning iron or steel in a lathe, and are best remedied by doubling back the upper or lower eyelid, according to the situation of the substance, and with the flat edge of a silver probe, taking up the metallic particle, using a lotion made by dissolving six grains of sugar of lead and the same of white vitriol, in six ounces of water, and bathing the eye three times a day till the inflammation subsides. Another plan is—Drop a solution of sulphate of copper (from one to three grains of the salt to one ounce of water) into the eye, or keep the eye open in a wineglassful of the solution. Bathe with cold lotion, and exclude light to keep down inflammation.

DISLOCATED THUMB—This is frequently produced by a fall. Make a clove hitch, by passing two loops of cord over the thumb, placing a piece of rag under the cord to prevent it cutting the thumb; then pull in the same line as the thumb. Afterwards apply a cold lotion.

CUTS AND WOUNDS—Clean cut wounds, whether deep or superficial, and likely to heal by the first intention, should always be washed or cleaned, and at once evenly and smoothly closed by bringing both edges close together, and securing them in that position by adhesive plaster. Cut thin strips of sticking plaster, and bring the parts together; or if large and deep, cut two broad pieces, so as to look like the teeth of a comb, and place one on each side of the wound, which must be cleaned previously. These pieces must be arranged so that they shall interlace one another; then, by laying hold of the pieces on the right side with one hand, and those on the other side with the other hand, and pulling them from one another, the edges of the wound are brought together without any difficulty.

Ordinary Cuts are dressed by thin strips, applied by pressing down the plaster on one side of the wound, and keeping it there and pulling in the opposite direction; then suddenly depressing the hand when the edges of the wound are brought together.

CONTUSIONS are best healed by laying a piece of folded lint, well wetted with extract of lead, or boracic acid, on the part, and, if there is much pain, placing a hot bran poultice over the dressing, repeating both, if necessary, every two hours. When the injuries are very severe, lay a cloth over the part, and suspend a basin over it filled with cold lotion. Put a piece of cotton into the basin, so that it shall allow the lotion to drop on the cloth, and thus keep it always wet.

HEMORRHAGE, when caused by an artery being divided or torn, may be known by the blood issuing out of the wound in leaps or jerks, and being of a bright scarlet color. If a vein is injured, the blood is darker and flows continuously. To arrest the latter, apply pressure by means of a compress and bandage. To arrest arterial bleeding, get a piece of wood (part of a broom handle will do), and tie a piece of tape to one end of it; then tie a piece of tape loosely over the arm, and pass the other end of the wood under it; twist the stick round and round until the tape compresses the arm sufficiently to arrest the bleeding, and then confine the other end by tying the string around the arm. A compress made by enfolding a penny piece in several folds of lint or linen should, however, be first placed under the tape and over the artery. If the bleeding is very obstinate, and it occurs in the *arm*, place a cork underneath the string, on the inside of the fleshy part, where the artery may be felt beating by any one; if in the *leg*, place a cork in the direction of a line drawn from the inner part of the knee towards the outer part of the groin. It is an excellent thing to accustom yourself to find out the position of these arteries, or, indeed, any that are superficial, and to explain to every person in your house where they are, and how to stop bleeding. If a stick cannot be got take a handkerchief, make a cord bandage of it, and tie a knot in the middle; the knot acts as a compress, and should be placed over the artery, while the two ends are to be tied around the thumb. Observe *always to place the ligature between the wound and the heart.* Putting your finger into a bleeding wound, and making pressure until a surgeon arrives, will generally stop violent bleeding.

BLEEDING FROM THE NOSE, from whatever cause, may generally be stopped by putting a plug of lint into the nostrils; if this does not do, apply a

cold lotion to the forehead; raise the head, and place over it both arms, so that it will rest on the hands; dip the lint plug, *slightly moistened*, into some powdered gum arabic, and plug the nostrils again; or dip the plug into equal parts of powdered gum arabic and alum, and plug the nose. Or the plug may be dipped in Friar's balsam, or tincture of kino. Heat should be applied to the feet; and, in obstinate cases, the sudden shock of a cold key, or cold water poured down the spine, will often instantly stop the bleeding. If the bowels are confined take a purgative. Injections of alum solution from a small syringe into the nose will often stop hemorrhage.

VIOLENT SHOCKS will sometimes stun a person, and he will remain unconscious. Untie strings, collars, etc.; loosen anything that is tight, and interferes with the breathing; raise the head; see if there is bleeding from any part; apply smelling-salts to the nose, and hot bottles to the feet.

IN CONCUSSION, the surface of the body is cold and pale, and the pulse weak and small, the breathing slow and *gentle*, and the pupil of the eye generally contracted or small. You can get an answer by speaking loud, so as to arouse the patient. Give a little brandy and water, keep the place quiet, apply warmth, and do not raise the head too high. If you tickle the feet the patient feels it.

IN COMPRESSION OF THE BRAIN from any cause, such as apoplexy, or a piece of fractured bone pressing on it, there is loss of sensation. If you tickle the feet of the injured person he does not feel it. You cannot arouse him so as to get an answer. The pulse is slow and labored; the breathing deep, labored, and *snorting;* the pupil enlarged. Raise the head, loosen strings or tight things, and send for a surgeon. If one cannot be got at once, apply mustard poultices to the feet and thighs, leeches to the temples, and hot water to the feet.

CHOKING—When a person has a fish bone in the throat, insert the forefinger, press upon the root of the tongue, so as to induce vomiting; it this does not do, let him swallow a *large piece* of potato or soft bread; and if these fail, give a mustard emetic.

FAINTING, HYSTERICS, ETC.—Loosen the garments, bathe the temples with water or eau-de-Cologne; open the window, admit plenty of fresh air, dash cold water on the face, apply hot bricks to the feet, and avoid bustle and excessive sympathy.

DROWNING—Attend to the following *essential rules:*—1. Lose no time. 2. Handle the body gently. 3. Carry the body face downwards, with the head gently raised, and never hold it up by the feet. 4. Send for medical assistance immediately, and in the meantime act as follows: 5. Strip the body; rub it dry, then wrap it in hot blankets, and place it in a warm bed in a warm room. 6. Cleanse away the froth and mucus from the nose and mouth. 7. Apply warm bricks, bottles, bags of sand, etc., to the armpits, between the thighs, and to the soles of the feet. 8. Rub the surface of the body with the hands inclosed in warm, dry worsted socks. 9. If possible, put the body into a warm bath. 10. To restore breathing, put the pipe of a common bellows into one nostril, carefully closing the other, and the mouth; at the same time drawing downwards, and pushing gently backwards, the upper part of the windpipe, to allow a more free admission of air; blow the bellows gently, in order to inflate the lungs, till the breast be raised a little; then set the mouth and nostrils free, and press gently on the chest; repeat this until signs of life appear. The body should be covered the moment it is placed on the table, except the face, and all the rubbing carried on under the sheet or blanket. When they can be obtained, a number of tiles or bricks should be made tolerably hot in the fire, laid in a row on the table, covered with a blanket, and the body placed in such a manner on them that their heat may enter the spine. When the patient revives, apply smelling-salts to the nose, give warm wine or brandy and water. *Cautions.*—1. Never rub the body with salt or spirits. 2. Never roll the body on casks. 3. Continue the remedies for twelve hours without ceasing.

HANGING—Loosen the cord, or whatever it may be by which the person has been suspended. Open the temporal artery or jugular vein, or bleed from the arm; employ electricity, if at hand, and proceed as for drowning, taking the additional precaution to apply eight or ten leeches to the temples.

APPARENT DEATH FROM DRUNKENNESS—Raise the head; loosen the clothes, maintain warmth of surface, and give a mustard emetic as soon as the person can swallow.

APOPLEXY AND FITS GENERALLY—Raise the head; loosen all tight clothes, strings, etc.; apply cold lotions to the head, which should be shaved; apply leeches to the temples, bleed, and send for a surgeon.

SUFFOCATION FROM NOXIOUS GASES, ETC.—Remove to the fresh air; dash cold vinegar and water in the face, neck, and breast; keep up the warmth of the body; if necessary, apply mustard poultices to the soles of the feet and to the spine, and try artificial respirations as in drowning, with electricity.

LIGHTNING AND SUNSTROKE—Treat the same as apoplexy.

POISONS AND THEIR ANTIDOTES.

Always send immediately for a medical man. Save all fluids vomited, and articles of food, cups, glasses, etc., used by the patient before taken ill, and lock them up.

As a rule give emetics after poisons that cause sleepiness and raving;—chalk, milk, eggs, butter, and warm water, or oil, after poisons that cause vomiting and pain in the stomach and bowels, with purging; and when there is no inflammation about the throat, tickle it with a feather to excite vomiting.

Vomiting may be caused by giving warm water, with a teaspoonful of mustard to the tumblerful, well stirred up. Sulphate of zinc (white vitriol) may be used in place of the mustard, or powdered alum. Powder of ipecacuanha, a teaspoonful rubbed up with molasses, may be employed for children. *Tartar emetic should never be given*, as it is excessively depressing, and uncontrolable in its effects. The stomach pump can only be used by skillful hands, and even then with caution.

Opium and other Narcotics—After vomiting has occurred, cold water should be *dashed* over the face and head. The patient must be kept awake, walked about between two strong persons, made to grasp the handles of a galvanic battery, dosed with strong coffee, and vigorously slapped. *Belladonna* is an antidote for opium and for morphia, etc., its active principles; and, on the other hand, the latter counteract the effects of belladonna. But a knowledge of medicine is necessary for dealing with these articles.

Strychnia—After emetics have been freely and successfully given, the patient should be allowed to breathe the vapor of sulphuric ether, poured on a handkerchief and held to the face, in such quantities as to keep down the tendency to convulsions. Bromide of potassium, twenty grains at a dose, dissolved in syrup, may be given every hour.

Alcoholic Poisoning should be combated by emetics, of which the sulphate of zinc, given as above directed, is the best. After that, strong coffee internally, and stimulation by heat externally, should be used.

Acids are sometimes swallowed by mistake. Alkalies, lime water, magnesia, or common chalk mixed with water, may be freely given, and afterward mucilaginous drinks, such as thick gum water or flaxseed tea.

Alkalies are less frequently taken in injurious strength or quantity, but sometimes children swallow lye by mistake. Common vinegar may be given freely, and then castor or sweet oil in full doses—a tablespoonful at a time, repeated every half hour or two.

Nitrate of silver when swallowed is neutralized by common table salt freely given in solution in water.

The salts of *mercury* or *arsenic* (often kept as bedbug poison), which are powerful irritants, are apt to be very quickly fatal. Milk or the whites of eggs may be freely given, and afterward a very thin paste of flour and water. In these cases an emetic is to be given *after* the poison is neutralized.

Phosphorus paste, kept for roach poison or in parlor matches, is sometimes eaten by children, and has been willfully taken for the purpose of suicide. It is a powerful irritant. The first thing to be done is to give freely of magnesia and water; then to give mucilaginous drinks, as flaxseed tea, gum water or sassafras pith and water; and lastly to administer finely-powdered bone-charcoal, either in pill or in mixture with water.

In no case of poisoning should there be any avoidable delay in obtaining the advice of a physician, and, meanwhile, the friends or bystanders should endeavor to find out exactly what has been taken, so that the treatment adopted may be as prompt and effective as possible.

DOSES OF MEDICINE.

NAME OF DRUG.	DOSE.	NAME OF DRUG.	DOSE.
Aloes	3 to 15 grains.	Syrup of Sarsaparilla	1 to 4 teasp'fuls.
Anise Oil	5 to 15 drops.	" Seneka	1 to 2 teasp'fuls.
Aqua Ammonia(dilute)	10 to 30 drops.	" Rhubarb	1 to 2 teasp'fuls.
Balsam Copaiba	10 to 40 drops.	Tannic Acid	1 to 5 grains.
Balsam of Fir	3 to 10 drops.	Tinct. of Aconite Root	1 to 5 drops.
Bismuth	5 to 40 grains.	" Aloes	1 to 8 teasp'fuls.
Bromide of Potassium	5 to 40 grains.	" Asafœtida	½ to 1 teasp'ful.
Buchu Leaves	20 to 40 grains.	" Belladona	10 to 30 drops.
Calomel (as alterative)	1-12 to 1 grain.	" Bloodroot	¼ to ½ teasp'ful.
Castor Oil	1 to 8 teasp'fuls.	" Columbo	1 to 2 teasp'fuls.
Citrate of Iron	2 to 5 grains.	" Camphor	5 to 60 drops.
Citrate Iron & Quinine	3 to 8 grains.	" Cayenne	10 to 60 drops.
Cream of Tartar	½ to 3 teasp'fuls.	" Castor	½ to 1 teasp'ful.
Dover's Powder	5 to 10 grains.	" Catechu	½ to 2 teasp'fuls.
Elecampane	20 to 60 grains.	" Cinch. Comp.	½ to 4 teasp'fuls.
Epsom Salts	½ to 1 ounce.	" Colchicum	15 to 60 drops.
Gallic Acid	5 to 10 grains.	" Digitalis	5 to 20 drops.
Iodide of Potassium	2 to 10 grains.	" Ginger	¼ to 1 teasp'ful
Kino	10 to 30 grains.	" Gentian Com	½ to 2 teasp'fuls.
Mandrake	5 to 20 grains.	" Guaiac	½ to 1 teasp'ful.
Mercury with Chalk	2 to 8 grains.	" Kino	½ to 2 teasp'fuls
Morphine	⅛ to ¼ grain.	" Lobelia	¼ to 1 teasp'ful.
Muriate of Ammonia	5 to 20 grains.	" Muriate Iron.	10 to 30 drops.
Opium	½ to 2 grains.	" Myrrh	½ to 1 teasp'ful.
Paregoric	1 teaspoonful.	" Nux Vomica.	5 to 10 drops.
Peppermint Essence	5 to 30 drops.	" Opium (Laudanum)	10 to 25 drops.
Pepsin	1 to 5 grains.	" Rhubarb	1 to 4 teasp'fuls.
Quinine	1 to 10 grains.	" " & Senna	1 to 4 teasp'fuls.
Rochelle Salts	½ to 1 ounce.	" Tolu	½ to 1 teasp'ful.
Rhubarb	5 to 30 grains.	" Valerian	½ to 2 teasp'fuls.
Saltpetre	5 to 20 grains.	Turpentine	10 to 40 drops.
Samonin	2 to 5 grains.	Wine Ipecac (Diaph.)	10 to 30 drops.
Syrup of Squills	½ to 1 teasp'ful.	" " (Emetic)	2 to 8 teasp'fuls.
" Iodide of Iron	15 to 30 drops.	" Colchicum Root	10 to 30 drops.
" Senna	1 to 6 teasp'fnls.		

Table of Proportionate Doses.

Age, years	80	65	50	25–40	20	16	12	8	5	2
Doses	⅝	¾	⅞	1	⅞	¾	⅝	½	⅜	¼

Age, months	12	6	2	1
Doses	1/5	1/8	1/15	1/24

Largest Safe Doses of Poisonous Drugs.

Every person should know the largest doses, which is safe to take, of active medicines. The following table shows the largest doses admissible, in grammes, and also the equivalent in grains for solids, and in minims for liquids. The doses are expressed in fractions, thus: 1-13, 1-64, meaning one-thirteenth, one-sixty-fourth. In non-professional hands it is the safest plan to strictly observe the rule of never giving the maximum dose of any medicine:

Medicines.	Grammes.	Grains.	Medicines.	Grammes.	Grains.
Arsenious Acid	.005	1-13	Ext. Opium	.1	1½
Acid, Carbolic	.05	¾	" Stramon, Seed	.05	¾
" Hydrocyanic	.06	1	Fowler's Solution	.4	6 min.
Aconita	.0041	-16	Lead, Sugar of	.06	9-10
Aconite Root	.15	2¼	Mercury, Corrosive Chlor.	.03	9-20
Arsenic, Iodide	.025	⅜	" Red Iodide	.03	9-20
Atropia	.001	1-64	Morphia and its Salts	.03	9-20
Atropia Sulph	.001	1-64	Nitrate Silver	.03	9-20
Barium, Chlor	.12	1⅞	Oil, Croton	.06	9-10
Belladonna, Herb	.2	3	Opium	.15	2¼
" Root	.1	1½	Phosphorus	.015	2-9
Codia	.05	¾	Potassa, Arsenite	.005	1-13
Conia	.001	1-64	" Cyanide	.03	9-20
Digitalis	.3	4½	Santonine	.1	1½
Ext Aconite Leaves	.1	1½	Soda, Arsenite	.005	1-13
" " Root	.025	⅜	Strychnia and Salts	.01	1-6
" Belladonna	.1	1½	Tartar Emetic	.2	3
" Cannabis Indica	.1	1½	Veratria	.005	1-13
" Conium	.18	2¾	Veratrum Viride	.3	4½
" Digitalis	2	3	Zinc, Chloride	.015	2-9
" Nux Vomica, Alc	.05	¾	" Valeriante	.06	9-10

Relative Value of Food (Beef par)

Oysters, 22; milk, 24: lobsters, 50; cream, 56; codfish, 68; eggs, 72; turbot, 84; mutton, 87; venison, 89; veal, 92; fowl, 94; herring, 100; beef, 100; duck, 104; salmon, 108; pork, 116; butter, 124; cheese, 155.

Percentage of Carbon in Food.

Cabbage, 3; beer, 4; carrots, 5; milk, 7; parsnips, 8; fish, 9; potatoes, 12; eggs, 16; beef, 27; bread, 27; cheese, 36; peas, 36; rice, 38; corn, 38; biscuit, 42; oatmeal, 42; sugar, 42; flour, 46; bacon, 54; cocoa, 69; butter, 79.

Foot-tons of Energy Per Ounce of Food.

Cabbage, 16; carrots, 20; milk, 24; ale, 30; potatoes, 38; porter, 42; beef, 55; egg, 57; ham, 65; bread, 83; egg (yolk), 127; sugar, 130; rice, 145; flour, 148; arrowroot, 151; oatmeal, 152; cheese, 168; butter, 281.

Loss of Meat in Cooking.

100 lbs. raw beef	= 67 lbs. roast	100 lbs. raw fowl	= 80 roast
100 " "	= 74 " boiled	100 " "	= 87 boiled
400 " raw mutton	= 75 " roast	100 " raw fish	= 94 boiled

The Percentage of Starch.

In common grains is as follows, according to Prof. Yeomans: Rice flour, 84 to 85; Indian meal, 77 to 80; oatmeal, 70 to 80; wheat flour, 39 to 77; barley flour, 67 to 70; rye flour, 50 to 61; buckwheat, 52; peas and beans, 42 to 43; potatoes (75 per cent. water), 13 to 15.

The Degrees of Sugar.

In various fruits are: Peach, 1.6; raspberry, 4.0; strawberry, 5.7; currant, 6.1; gooseberry, 7.2; apple, 7.9; mulberry, 9.2; pear, 9.4; cherry, 10.8; grape, 14.9.

Digestion of Various Foods.

Easy of Digestion—Arrowroot, asparagus, cauliflower, baked apples, oranges, grapes, strawberries, peaches.

Moderately Digestible—Apples, raspberries, bread, puddings, rhubarb, chocolate, coffee, porter.

Hard to Digest—Nuts, pears, plums, cherries, cucumbers, onions, carrots, parsnips.

TIME REQUIRED FOR DIGESTION.

	Hrs.	Min.
Apples, sweet	1	30
" sour	2	00
Beans, pod, boiled	2	30
Beef, fresh, rare, roasted	3	00
" " dried	3	30
" " fried	4	00
Beets, boiled	3	45
Bread, wheat, fresh	3	30
" corn	3	15
Butter (melted)	3	30
Cabbage, with vinegar, raw	2	00
" boiled	4	30
Cheese (old, strong)	3	30
Codfish	2	00
Custard, baked	2	45
Ducks, domestic, roasted	4	00
" wild, "	4	30
Eggs, fresh, hard, boiled	3	30
" " soft "	3	00
" " fried	3	30
Goose, roast	2	00
Lamb, fresh, boiled	2	30
Liver, beef, boiled	2	00
Milk, boiled	2	00
" raw	2	15
Parsnips, boiled	2	30
Mutton, roast	3	15
" broiled	3	00
" boiled	3	00
Oysters, raw	2	55
" roast	3	15
" stewed	3	30
Pork, fat and lean, roast	5	15
" " " boiled	3	15
" " " raw	3	00
Potatoes, boiled	3	30
" baked	2	30
Rice boiled	1	00
Sago "	1	45
Salmon, salted, boiled	4	00
Soup, beef, vegetable	4	00
" chicken boiled	3	00
" oyster "	3	30
Tapioca, boiled	2	00
Tripe, soused, boiled	1	00
Trout, fresh, boiled or fried	1	30
Turkey, domestic, roast	2	00
" wild, roast	2	18
Turnips, boiled	3	30
Veal, fresh, broiled	4	00
" fresh, fried	4	30
Venison steak, broiled	1	35

Fat, Water and Muscle Properties of Food.

100 PARTS.	Water.	Muscle.	Fat.
Cucumbers	97.0	1.5	1.0
Turnips	94.4	1.1	4.0
Cabbage	90.0	4.0	5.0
Milk, cows'	86.0	5.0	8.0
Apples	84.0	5.0	10.0
Eggs, yolk of	79.0	15.0	27.0
Potatoes	75.2	1.4	22.5
Veal	68.5	10.1	1.65
Eggs, white of	53.0	17.0	.0
Lamb	50.5	11.0	35.0
Beef	50.0	15.0	30.0
Chicken	46.0	18.0	32.0
Mutton	44.0	12.5	40.0
Pork	38.5	10.00	50.0
Beans	14.8	24.0	57.7
Buckwheat	14.2	8.6	75.4
Barley	14.0	15.0	68.8
Corn	14.0	12.0	73.0
Peas	14.0	23.4	60.0
Wheat	14.0	14.6	69.4
Oats	13.6	17.0	66.4
Rice	13.5	6.5	79.5
Cheese	10.0	65.0	19.0
Butter			100.0

Percentage of Nutrition in Various Articles of Food.

Raw cucumbers, 2; raw mellons, 3; boiled turnips, 4½; milk, 7; cabbage, 7½; currants, 10; whipped eggs, 13; beets, 14; apples, 16; peaches, 20; boiled codfish, 21; broiled venison, 22; potatoes, 22½; fried veal, 24; roast pork, 24; roast poultry, 26; raw beef, 26; raw grapes, 27; raw plums, 29; broiled mutton, 30; oatmeal porridge, 75; rye bread, 79; boiled beans, 87; boiled rice, 88; barley bread, 88; wheat bread, 90; baked corn bread, 91; boiled barley, 92; butter, 93; boiled peas, 93; raw oils, 94.

USEFUL RECIPES, TRADE SECRETS, ETC.

Toothache Cure. Compound tinct. benzoin is said to be one of the most certain and speedy cures for toothache; pour a few drops on cotton, and press at once into the diseased cavity, when the pain will almost instantly cease.

Toothache Tincture. Mix tannin, 1 scruple; mastic, 3 grains; ether, 2 drams. Apply on cotton wool, to the tooth, previously dried.

Charcoal Tooth Paste. Chlorate of potash, ½ dram; mint water, 1 ounce. Dissolve and add powdered charcoal, 2 ounces; honey, 1 ounce.

Excellent Mouth Wash. Powdered white Castile soap, 2 drams; alcohol, 3 ounces; honey, 1 ounce; essence or extract jasmine, 2 drams. Dissolve the soap in alcohol and add honey and extract.

Removing Tartar from the Teeth. This preparation is used by dentists. Pure muriatic acid, one ounce; water, one ounce; honey, two ounces; mix thoroughly. Take a toothbrush, and wet it freely with this preparation, and briskly rub the black teeth, and in a moment's time they will be perfectly white; then immediately wash out the mouth well with water, that the acid may not act on the enamel of the teeth. This should be done only occasionally.

Bad Breath. Bad breath from catarrh, foul stomach, or bad teeth, may be temporarily relieved by diluting a little bromo chloralum with eight or ten parts of water, and using it as a gargle, and swallowing a few drops before going out. A pint of bromo chloralum costs fifty cents, but a small vial will last a long time.

Good Tooth Powder. Procure, at a druggist's, half an ounce of powdered orris root, half an ounce of prepared chalk finely pulverized, and two or three small lumps of Dutch pink. Let them all be mixed in a mortar, and pounded together. The Dutch pink is to impart a pale reddish color. Keep it in a close box.

Another Tooth Powder. Mix together, in a mortar, half an ounce of red Peruvian bark, finely powdered; a quarter of an ounce of powdered myrrh; and a quarter of an ounce of prepared chalk.

A Safe Depilatory. Take a strong solution of sulphuret of barium, and add enough finely powdered starch to make a paste. Apply to the roots of the hair and allow it to remain on a few minutes, then scrape off with the back edge of a knife blade, and rub with sweet oil.

Quick Depilatory for Removing Hair. Best slacked lime, 6 ounces; orpiment, fine powder, 1 ounce. Mix with a covered sieve and preserve in a dry place in closely stoppered bottles. In using mix the powder with enough water to form a paste, and apply to the hair to be removed. In about five minutes, or as soon as its caustic action is felt on the skin, remove, as in shaving, with an ivory or bone paper knife, wash with cold water freely, and apply cold cream.

Tricopherous for the Hair. Castor oil, alcohol, each 1 pint; tinct. cantharides, one ounce; oil bergamot, ½ ounce; alkanet coloring, to color as wished. Mix and let it stand forty-eight hours, with occasional shaking, and then filter.

Liquid Shampoo. Take bay rum, 2½ pints; water, ½ pint; glycerine, 1 ounce; tinct. cantharides, 2 drams; carbonate of ammonia, 2 drams borax, ½ ounce; or take of New England rum, 1½ pints; bay rum, 1 pint; water ½ pint; glycerine, 1 ounce; tinct. cantharides, 2 drams; ammon. carbonate, 2 drams; borax, ½ ounce; the salts to be dissolved in water and the other ingredients to be added gradually.

Cleaning Hair Brushes. Put a teaspoonful or dessertspoonful of aqua ammonia into a basin half full of water, comb the loose hairs out of the brush, then agitate the water briskly with the brush, and rinse it well with clear water

Hair Invigorator. Bay rum, two pints; alcohol, one pint; castor oil, one ounce; carb. ammonia, half an ounce; tincture of cantharides, one ounce. Mix them well. This compound will promote the growth of the hair and prevent it from falling out.

For Dandruff. Take glycerine, four ounces; tincture of cantharides, five ounces; bay rum, four ounces; water, two ounces. Mix, and apply once a day, and rub well down the scalp.

Mustache Grower. Simple cerate, 1 ounce; oil bergamot, 10 minims; saturated tinct. of cantharides, 15 minims. Rub them together thoroughly, or melt the cerate and stir in the tincture while hot, and the oil as soon as it is nearly cold, then run into molds or rolls. To be applied as a pomade, rubbing in at the roots of the hair. Care must be used not to inflame the skin by too frequent application.

Razor-strop Paste. Wet the strop with a little sweet oil, and apply a little flour of emery evenly over the surface.

Shaving Compound. Half a pound of plain white soap, dissolved in a small quantity of alcohol, as little as can be used; add a tablespoonful of pulverized borax. Shave the soap and put it in a small tin basin or cup; place it on the fire in a dish of boiling water; when melted, add the alcohol, and remove from the fire; stir in oil of bergamot sufficient to perfume it.

Cure for Prickly Heat. Mix a *large* portion of wheat bran with either cold or lukewarm water, and use it as a bath twice or thrice a day. Children who are covered with prickly heat in warm weather will be thus effectually relieved from that tormenting eruption. As soon as it begins to appear on the neck, face, or arms, commence using the bran water on these parts repeatedly through the day, and it may probably spread no farther. If it does, the bran water bath will certainly cure it, if persisted in.

To Remove Corns from Between the Toes. These corns are generally more painful than any others, and are frequently situated as to be almost inaccessible to the usual remedies. Wetting them several times a day with hartshorn will in most cases cure them. Try it.

Superior Cologne Water. Oil of lavender, two drams; oil of rosemary, one dram and a half; orange, lemon and bergamot, one dram each of the oil; also two drams of the essence of musk, attar of rose ten drops, and a pint of proof spirit. Shake all together thoroughly three times a day for a week.

Inexhaustible Smelling Salts. Sal tartar, three drams; muriate ammonia, granulated, 6 drams; oil neroli, 5 minims; oil lavender flowers, 5 minims; oil rose, 3 minims; spirits ammonia, 15 minims. Put into the pungent a small piece of sponge filling about one-fourth the space, and pour on it a due proportion of the oils, then put in the mixed salts until the bottle is three-fourths full, and pour on the spirits of ammonia in proper proportion and close the bottle.

Volatile Salts for Pungents. Liquor ammon., fort, 1 pint, oil lavender flowers, 1 dram, oil rosemary, fine, 1 dram, oil bergamot, ½ dram, oil peppermint, 10 minims. Mix thoroughly and fill pungents or keep in well stoppered bottle. Another formula is, sesqui-carbonate of ammonia, small pieces, 10 ounces, concentrated liq. ammonia, 5 ounces. Put the sesqui-carb. in a wide mouth jar with air-tight stopper, perfume the liquor ammonia to suit and pour over the carbonate, close tightly the lid and place in a cool place, stir with a stiff spatula every other day for a week, and then keep it closed for two weeks, or until it becomes hard, when it is ready for use.

Paste for Papering Boxes. Boil water and stir in batter of wheat or rye flour. Let it boil one minute, take off and strain through a colander. Add, while boiling, a little glue or powdered alum. Do plenty of stirring while the paste is cooking, and make of consistency that will spread nicely.

Aromatic Spirit of Vinegar. Acetic acid, No. 8, pure, 8 ounces; camphor, ½ ounce. Dissolve and add oil lemon, oil lavender flowers, each two drams; oil cassia, oil cloves, ½ dram each. Thoroughly mix and keep in well stoppered bottle.

Rose-Water. Preferable to the distilled for a perfume, or for culinary purposes: Attar of rose, twelve drops; rub it up with half an ounce of white sugar and two drams carbonate magnesia, then add gradually one quart of water and two ounces of proof spirit, and filter through paper.

Bay Rum. French proof spirit, one gallon; extract bay, six ounces. Mix and color with caramel; needs no filtering.

Fine Lavender Water. Mix together, in a clean bottle, a pint of inodorous spirit of wine, an ounce of oil of lavender, a teaspoonful of oil of bergamot, and a tablespoonful of oil of ambergris.

The Virtues of Turpentine. After a housekeeper fully realizes the worth of turpentine in the household, she is never willing to be without a supply of it. It gives quick relief to burns, it is an excellent application for corns, it is good for rheumatism and sore throats, and it is the quickest remedy for convulsions or fits. Then it is a sure preventive against moths by just dropping a trifle in the bottom of drawers, chests and cupboards, it will render the garments secure from injury during the summer. It will keep ants and bugs from closets and store-rooms by putting a few drops in the corners and upon the shelves it is sure destruction to bedbugs, and will effectually drive them away from their haunts if thoroughly applied to all the joints of the bedstead in the spring cleaning time, and injures neither furniture nor clothing. A spoonful of it added to a pail of warm water is excellent for cleaning paint. A little in suds washing days lightens laundry labor.

A Perpetual Paste is a paste that may be made by dissolving an ounce of alum in a quart of warm water. When cold, add as much flour as will make it the consistency of cream, then stir into it half a teaspoonful of powdered resin, and two or three cloves. Boil it to a consistency of mush, stirring all the time. It will keep for twelve months, and when dry may be softened with warm water.

Paste for Scrap Books. Take half a teaspoonful of starch, same of flour, pour on a little boiling water, let it stand a minute, add more water, stir and cook it until it is thick enough to starch a shirt bosom. It spreads smooth, sticks well and will not mold or discolor paper. Starch alone will make a very good paste.

A Strong Paste. A paste that will neither decay nor become moldy. Mix good clean flour with cold water into a thick paste well blended together, then add boiling water, stirring well up until it is of a consistency that can be easily and smoothly spread with a brush; add to this a spoonful or two of brown sugar, a little corrosive sublimate and about half a dozen drops of oil of lavender, and you will have a paste that will hold with wonderful tenacity.

A Brilliant Paste. A brilliant and adhesive paste, adapted to fancy articles, may be made by dissolving caseine precipitated from milk by acetic acid and washed with pure water in a saturated solution of borax.

A Sugar Paste. In order to prevent the gum from cracking, to ten parts by weight of gum arabic and three parts of sugar, add water until the desired consistency is obtained. If a very strong paste is required, add a quantity of flour equal in weight to the gum, without boiling the mixture. The paste improves in strength when it begins to ferment.

Tin Box Cement. To fix labels to tin boxes either of the following will answer: 1. Soften good glue in water, then boil it in strong vinegar, and thicken the liquid while boiling with fine wheat flour, so that a paste results. 2. Starch paste, with which a little Venice turpentine has been incorporated while warm.

Paper and Leather Paste. Cover four parts, by weight, of glue, with fifteen parts of cold water, and allow it to soak for several hours, then warm moderately till the solution is perfectly clear, and dilute with sixty parts of boiling water, intimately stirred in. Next prepare a solution of thirty parts of starch in two hundred parts of cold water, so as to form a thin homogeneous liquid, free from lumps, and pour the boiling glue solution into it with thorough stirring, and at the same time keep the mass boiling.

Commercial Mucilage. The best quality of mucilage in the market is made by dissolving clear glue in equal volumes of water and strong vinegar, and adding one-fourth of an equal volume of alcohol, and a small quantity of a solution of alum in water. Some of the cheaper preparations offered for sale are merely boiled starch or flour, mixed with nitric acid to prevent their gelatinizing.

Acid-Proof Paste. A paste formed by mixing powdered glass with a concentrated solution of silicate of soda makes an excellent acid-proof cement.

Paste to Fasten Cloth to Wood. Take a plump pound of wheat flour, one tablespoonful of powdered resin, one tablespoonful of finely powdered alum, and rub the mixture in a suitable vessel, with water, to a uniform, smooth paste; transfer this to a small kettle over a fire, and stir until the paste is perfectly homogeneous without lumps. As soon as the mass has become so stiff that the stirrer remains upright in it, transfer it to another vessel and cover it up so that no skin may form on its surface.

This paste is applied in a very thin layer to the surface of the table; the cloth, or leather, is then laid and pressed upon it, and smoothed with a roller. The ends are cut off after drying. If leather is to be fastened on, this must first be moistened with water. The paste is then applied, and the leather rubbed smooth with a cloth.

Paste for Printing Office. Take two gallons of cold water and one quart wheat flour, rub out all the lumps, then add one-fourth pound of finely pulverized alum and boil the mixture for ten minutes, or until a thick consistency is reached. Now add one quart of hot water and boil again, until the paste becomes a pale brown color, and thick. The paste should be well stirred during both processes of cooking. Paste thus made will keep sweet for two weeks and prove very adhesive.

To Take Smoke Stains from Walls. An easy and sure way to remove smoke stains from common plain ceilings is to mix wood ashes with the whitewash just before applying. A pint of ashes to a small pail of whitewash is sufficient, but a little more or less will do no harm.

To Remove Stains from Broadcloth. Take an ounce of pipe clay, which has been ground fine, mix it with twelve drops of alcohol and the same quantity of spirits of turpentine. Whenever you wish to remove any stains from cloth, moisten a little of this mixture with alcohol and rub it on the spots. Let it remain till dry, then rub it off with a woolen cloth, and the spots will disappear.

To Remove Red Stains of Fruit from Linen. Moisten the cloth and hold it over a piece of burning sulphur, then wash thoroughly, or else the spots may reappear.

To Remove Oil Stains. Take three ounces of spirits of turpentine and one ounce of essence of lemon, mix well, and apply it as you would any other scouring drops. It will take out all the grease.

Iron Stains may be removed by the salt of lemons. Many stains may be removed by dipping the linen in sour buttermilk, and then drying it in a hot sun; wash it in cold water, repeat this three or four times.

To Remove Oil Stains from Wood. Mix together fuller's earth and soap lees, and rub it into the boards. Let it dry and then scour it off with some strong soft soap and sand, or use lees to scour it with. It should be put on hot, which may easily be done by heating the lees.

To Remove Tea Stains. Mix thoroughly soft soap and salt—say a tablespoonful of salt to a teacupful of soap, rub on the spots, and spread the cloth on the grass where the sun will shine on it. Let it lie two or three days, then wash. If the spots are wet occasionally while lying on the grass, it will hasten the bleaching

To Remove Stains from Muslin. If you have stained your muslin or gingham dress, or your white pants with berries, before wetting with anything else, pour boiling water through the stains and they will disappear. Before fruit juice dries it can often be removed by cold water, using a sponge and towel if necessary.

To Remove Acid Stains. Stains caused by acids may be removed by tying some pearlash up in the stained part; scrape some soap in cold, soft water, and boil the linen until the stain is gone.

To Disinfect Sinks and Drains. Copperas dissolved in water, one-fourth of a pound to a gallon, and poured into a sink and water drain occasionally, will keep such places sweet and wholesome. A little chloride of lime, say half a pound to a gallon of water, will have the same effect, and either of these costs but a trifle.

A preparation may be made at home which will answer about as well as the chloride of lime. Dissolve a bushel of salt in a barrel of water, and with the salt water slack a barrel of lime, which should be made wet enough to form a thin paste or wash.

To Disinfect a Cellar. A damp, musty cellar may be sweetened by sprinkling upon the floor pulverized copperas, chloride of lime, or even common lime. The most effective means I have ever used to disinfect decaying vegetable matter is chloride of lime in solution. One pound may be dissolved in two gallons of water. Plaster of Paris has also been found an excellent absorbent of noxious odors. If used one part with three parts of charcoal, it will be found still better.

How to Thaw Out a Water Pipe. Water pipes usually freeze up when exposed, for inside the walls, where they cannot be reached, they are or should be packed to prevent freezing. To thaw out a frozen pipe, bundle a newspaper into a torch, light it, and pass it along the pipe slowly. The ice will yield to this much quicker than to hot water or wrappings of hot cloths, as is the common practice.

To Prevent Mold. A small quantity of carbolic acid added to paste, mucilage, and ink, will prevent mold. An ounce of the acid to a gallon of whitewash will keep cellars and dairies from the disagreeable odor which often taints milk and meat kept in such places.

Economical Fire Kindler. One may be made by dipping corn cobs in a mixture of melted resin and tar, and drying.

Thawing Frozen Gas Pipe. Mr. F. H. Shelton says: "I took off from over the pipe some four or five inches, just a crust of earth, and then put a couple of bushels of lime in the space, poured water over it, and slacked it, and then put canvas over that, and rocks on the canvas, so as to keep the wind from getting underneath. Next morning, on returning there, I found that the frost had been drawn out from the ground for nearly three feet. You can appreciate what an advantage that was, for picking through frozen ground, with the thermometer below zero, is no joke. Since then we have tried it several times. It is an excellent plan if you have time enough to let the lime work. In the daytime you cannot afford to waste the time, but if you have a spare night in which to work, it is worth while to try it."

How to Test a Thermometer. The common thermometer in a japanned iron case is usually inaccurate. To test the thermometer, bring water into the condition of active boiling, warm the thermometer gradually in the steam and then plunge it into the water. If it indicate a fixed temperature of two hundred and twelve degrees, the instrument is a good one.

How to Keep Eggs Fresh. The great secret in keeping eggs consists in entirely excluding the air from the interior. The lining next to the shell is, when in its natural stage, impervious to air, and the albumen is calculated to sustain it, but dampness and heat will cause decay, and, if the egg is allowed to lie in one position, especially upon one side, the yolk sinks through the albumen and settles upon the lining, and, not possessing proper qualities for preserving the skin in a healthy condition, it dries, and air penetrates and begins the work of destruction. Where eggs are set upon their small ends, the yolk is much less liable to reach the lining of the shell. Where eggs are packed in a barrel, keg or bucket, it is a good plan to turn the whole quantity onto a different side once in a while.

Indelible Ink. An indelible ink that cannot be erased, even with acids, can be obtained from the following recipe: To good gall ink add a strong solution of Prussian blue dissolved in distilled water. This will form a writing fluid which cannot be erased without destruction of the paper. The ink will write greenish blue, but afterward will turn black.

To Get a Broken Cork Out of a Bottle. If in drawing a cork, it breaks, and the lower part falls down into the liquid, tie a long loop in a bit of twine, or small cord, and put it in, holding the bottle so as to bring the piece of cork near to the lower part of the neck. Catch it in the loop, so as to hold it stationary. You can then easily extract it with a corkscrew.

A Wash for Cleaning Silver. Mix together half an ounce of fine salt, half an ounce of powdered alum, and half an ounce of cream of tartar. Put them into a large white-ware pitcher, and pour on two quarts of water, and stir them frequently, till entirely dissolved. Then transfer the mixture to clean bottles, and cork them closely. Before using it, shake the bottles well. Pour some of the liquid into a bowl, and wash the silver all over with it, using an old, soft, fine linen cloth. Let it stand about ten minutes, and then rub it dry, with a buckskin. It will make the silver look like new.

To Remove the Odor from a Vial. The odor of its last contents may be removed from a vial by filling it with cold water, and letting it stand in any airy place uncorked for three days, changing the water every day.

To Loosen a Glass Stopper. The manner in which apothecaries loosen glass stoppers when there is difficulty in getting them out, is to press the thumb of the right hand very hard against the lower part of the stopper, and then give the stopper a twist the other way, with the thumb and forefinger of the left hand, keeping the bottle stiff in a steady position.

To Make Shoes or Boots Water-Proof. Melt together, in a pipkin, equal quantities of beeswax and mutton suet. While liquid rub it over the leather, including the soles.

To Soften Boots and Shoes. Kerosene will soften boots and shoes which have been hardened by water, and render them as pliable as new.

To Remove Stains, Spots, and Mildew from Furniture. Take half a pint of ninety-eight per cent. alcohol, a quarter of an ounce each of pulverized resin and gum shellac, add half a pint of linseed oil, shake well and apply with a brush or sponge. Sweet oil will remove finger marks from varnished furniture, and kerosene from oiled furniture.

To Freshen Gilt Frames. Gilt frames may be revived by carefully dusting them, and then washing with one ounce of soda beaten up with the whites of three eggs. Scraped patches should be touched up with gold paint. Castile soap and water, with proper care, may be used to clean oil paintings. Other methods should not be employed without some skill.

To Fill Cracks in Plaster. Use vinegar instead of water to mix your plaster of Paris. The resultant mass will be like putty, and will not "set" for twenty or thirty minutes, whereas if you use water the plaster will become hard almost immediately, before you have time to use it. Push it into the cracks and smooth it off nicely with a tableknife.

To Toughen Lamp Chimneys and Glassware. Immerse the article in a pot filled with cold water, to which some common salt has been added. Boil the water well, then cool slowly. Glass treated in this way will resist any sudden change of temperature.

To Remove Paint from Window-Glass. Rub it well with hot, sharp vinegar.

To Clean Stovepipe. A piece of zinc put on the live coals in the stove will clean out the stovepipe.

To Brighten Carpets. Carpets after the dust has been beaten out may be brightened by scattering upon them cornmeal mixed with salt and then sweeping it off. Mix salt and meal in equal proportions. Carpets should be thoroughly beaten on the wrong side first and then on the right side, after which spots may be removed by the use of ox-gall or ammonia and water.

Kerosene Stains in Carpets may be removed by sprinkling buckwheat flour over the spot. If one sprinkling is not enough, repeat.

To Keep Flowers Fresh exclude them from the air. To do this wet them thoroughly, put in a damp box, and cover with wet raw cotton or wet newspaper, then place in a cool spot. To preserve bouquets, put a little saltpetre in the water you use for your bouquets, and the flowers will live for a fortnight.

To Preserve Brooms. Dip them for a minute or two in a kettle of boiling suds once a week and they will last much longer, making them tough and pliable. A carpet wears much longer swept with a broom cared for in this manner.

To Clean Brassware. Mix one ounce of oxalic acid, six ounces of rotten stone, all in powder, one ounce of sweet oil, and sufficient water to make a paste. Apply a small proportion, and rub dry with a flannel or leather. The liquid dip most generally used consists of nitric and sulphuric acids, but this is more corrosive.

Polish or Enamel for Shirt Bosoms is made by melting together one ounce of white wax and two ounces of spermaceti; heat gently and turn into a very shallow pan; when cold cut or break in pieces. When making boiled starch the usual way, enough for a dozen bosoms, add to it a piece of the polish the size of a hazel nut.

To Keep Out Mosquitoes. If a bottle of the oil of pennyroyal is left uncorked in a room at night, not a mosquito, nor any other blood-sucker, will be found there in the morning.

Destruction of Rats. The following recipe for the destruction originated with Dr. Ure, and is highly recommended as the best-known means of getting rid of these most obnoxious and destructive vermin. Melt hog's lard in a bottle plunged in water, heated to about 150 degrees of Fahrenheit, introduce into it half an ounce of phosphorus for every pound of lard, then add a pint of proof spirit, or whisky, cork the bottle firmly after its contents have been heated to 150 degrees, taking it at the same time out of the water, and agitate smartly until the phosphorus becomes uniformly diffused, forming a milky-looking liquid. This liquid, being cooled, will afford a white compound of phosphorus and lard, from which the spirit spontaneously separates, and may be poured off to be used again for the same purpose, but not for drinking, for none of it enters into the combination, but it merely serves to comminute the phosphorus, and diffuse it in very small particles through the lard. This compound, on being warmed very gently, may be poured out into a mixture of wheat flour and sugar, incorporated therewith, and then flavored with oil of rhodium, or not, at pleasure. The flavor may be varied with oil of aniseed, etc. This dough, being made into pellets, is to be laid into rat holes. By its luminousness in the dark, it attracts their notice, and, being agreeable to their palates and noses, it is readily eaten, and proves certainly fatal.

To Kill Cockroaches. A teacupful of well bruised plaster of Paris, mixed with double the quantity of oatmeal, to which a little sugar may be added, although this last named ingredient is not essential. Strew it on the floor, or into the chinks where they frequent.

Earwigs are very destructive insects, their favorite food being the petals of roses, pinks, dahlias, and other flowers. They may be caught by driving stakes into the ground, and placing on each an inverted flower pot, for the earwigs will climb up and take refuge under the pot, when they may be taken out and killed. Clean bowls of tobacco pipes, placed in like manner on the tops of smaller sticks, are very good traps, or very deep holes may be made in the ground with a crowbar, into which they will fall, and may be destroyed by boiling water.

To Destroy Ants. Drop some quicklime on the mouth of their nest, and wash it in with boiling water, or dissolve some camphor in spirits of wine, then mix with water, and pour into their haunts, or tobacco water, which has been found effectual. They are averse to strong scents. Camphor, or a sponge saturated with creosote, will prevent their infesting a cupboard. To prevent their climbing up trees, place a ring of tar about the trunk, or a circle of rag moistened occasionally with creosote.

To Prevent Moths. In the month of April or May, beat your fur garments well with a small cane or elastic stick, then wrap them up in linen, without pressing them too hard, and put betwixt the folds some camphor in small lumps; then put your furs in this state in boxes well closed. When the furs are wanted for use, beat them well as before, and expose them for twenty-four hours to the air, which will take away the smell of the camphor. If the fur has long hair, as bear or fox, add to the camphor an equal quantity of black pepper in powder.

To Get Rid of Moths. 1. Procure shavings of cedar wood, and inclose in muslin bags, which can be distributed freely among the clothes.

2. Procure shavings of camphor wood, and inclose in bags.

3. Sprinkle pimento (allspice) berries among the clothes.

4. Sprinkle the clothes with the seeds of the musk plant.

5. To destroy the eggs, when deposited in woolen cloths, etc., use a solution of acetate of potash in spirits of rosemary, fifteen grains to the pint.

Bed Bugs. Spirits of naphtha rubbed with a small painter's brush into every part of the bedstead is a certain way of getting rid of bugs. The mattress and binding of the bed should be examined, and the same process attended to, as they generally harbor more in these parts than in the bedstead. Ten cents' worth of naphtha is sufficient for one bed.

Bug Poison. Proof spirit, one pint; camphor, two ounces; oil of turpentine, four ounces; corrosive sublimate, one ounce. Mix. A correspondent says, "I have been for a long time troubled with bugs, and never could get rid of them by any clean and expeditious method, until a friend told me to suspend a small bag of camphor to the bed, just in the center, overhead. I did so, and the enemy was most effectually repulsed, and has not made his appearance since—not even for a reconnoissance!" This is a simple method of getting rid of these pests, and is worth a trial to see if it be effectual in other cases.

Mixture for Destroying Flies. Infusion of quassia, one pint; brown sugar, four ounces; ground pepper, two ounces. To be well mixed together, and put in small, shallow dishes when required.

To Destroy Flies in a room, take half a teaspoonful of black pepper in powder, one teaspoonful of brown sugar, and one tablespoonful of cream, mix them well together, and place them in the room on a plate, where the flies are troublesome, and they will soon disappear.

How to Destroy Insects. The Bureau of Entomology, Department of Agriculture, Washington, sends out the following, for use as insecticides on or about plants, etc.: London purple—To twenty pounds flour from one-quarter to one-half pound is added and well mixed. This is applied with a sifter or blower. With forty gallons of water one-quarter to one-half pound is mixed for spraying. Paris Green—With twenty pounds of flour from three-quarters to one pound is mixed and applied by sifting or by a blower. The same amount of the insecticide to forty gallons of water is used as a spray. Bisulphate of Carbon—For use in the ground a quantity is poured or injected among the roots that are being infected. Against insects damaging stored grain of museum material a small quantity is used in an air-tight vessel. Carbolic Acid—A solution of one part in 100 of water is used against parasites on domestic animals and their barns and sheds; also on the surface of plants and among the roots in the ground. Helebore—The powder is sifted on alone or mixed one part to twenty of flour. With one gallon of water one-quarter pound is mixed for spraying. Kerosene-Milk Emulsion—To one part milk add two parts kerosene, and churn by force pump or other agitator. The butter-like emulsion is diluted ad libitum with water. An easier method is to simply mix one part kerosene with eight of milk. Soap Emulsion—In one gallon hot water one-half pound whale oil soap is dissolved. This, instead of milk, is mixed to an emulsion with kerosene in the same manner and proportion as above. Pyrethrum, Persian Insect Powder—Is blown or sifted on dry, also applied in water one gallon to a tablespoonful of the powder, well stirred and then sprayed. Tobacco Decoction—This is made as strong as possible as a wash or spray to kill insect pests on animals and plants.

300 FACTS ABOUT POULTRY.

Characteristics of the Various Breeds Concisely Stated.

No.	Races.	Weight of Chick, one day old.	Daily Increase of the Weight of Chick during 20 days.	Annual Laying.	Weight of Eggs.	Quantity of Food Daily.	Average Weight of Flesh at 6 months.	Average Weight of Bone.
		oz.	oz.	E'gs	oz.	oz.	lbs. oz.	oz. dr.
1	Crevecœur	1 9-16	5-16	122	2 3-4	7	4 10	7 15
2	Houdan	1 3-8	11-32	125	2 3-16	6 13-16	3 15	7 0¾
3	La Bresse, black	1 7-16	1-4	160	2 13-16	6 13-16	3 8	5 4½
4	La Bresse, gray	1 5-16	1-4	150	1 7-8	5 1-4	3 7	5 1¾
5	Barbezieux	1 10-16	5-16	140	2 7-16	6 10-16	4 11	8 7½
6	La Fleche	1 1-2	7-32	140	2 7-16	6 13-16	3 6	6 5½
7	Le Mans	1 10-16	5-16	111	2 1-4	6 14-16	4 5	7 12
8	Gournay	1 3-16	3-16	140	2 7-16	4 11-16	2 10	4 9
9	Courtes Pattes	1 1-4	3-16	150	2 3-16	6 10-16	3 10	5 7½
10	Andalusian	1 5-16	1-4	165	2 7-16	6 12-16	3 1	5 13
11	Brahma	1 5-8	7-32	120	2 1-4	9 1-2	4 11	10 15
12	Campine, silver spangled	1 1-16	3-16	225	1 11-16	5 1-2	2 3	4 3¾
13	Cochin, cinnamon	1 13-16	3-16	115	2 1-16	10 1-2	4 9	14 4½
14	Game	1 5-16	7-32	100	2 7-16	5 1-4	3 10	4 6½
15	Cosaque	1 3-16	1-4	120	2 3-16	4 1-4	2 15	4 15
16	Dominique	1 1-4	7-32	110	2 7-32	4 3-4	3 11	5 5¾
17	Dorking	1 7-16	11-32	130	1 15-16	6 13-16	5 4	7 6½
18	Spanish	1 5-16	7-32	160	2 3-4	6 13-16	3 1	9 8¼
19	Hamburg, silver spangled	1 2-16	7-32	239	1 11 16	5 1-4	2 3½	4 6½
20	Dutch, black	1 1-16	2-16	98	2	5 1-2	2 3	4 9
21	Langshan	1 5-8	5-16	115	2 3-16	7	5 4	10 10½
22	Leghorn, silver spangled	1 1-4	1-4	190	2 7-32	6	3 15	7 0¾
23	Polands, golden spangled	1 3-16	3-16	100	2 1-16	4	2 13	4 12
24	Scotch Grey	1 1-4	7-32	110	2 7-32	6 13-16	3 4½	4 15
25	Bantam, silver spangled	9-16	.....	80	1 1-8	2 7-8	.....	.....
26	Game Bantam	7-16	.....	90	1 1-32	2 3-4	.....	.....
27	Nagasaki	1-2	.....	95	1 3-32	3 1-8	.....	.....
28	Silkies	3-4	.....	98	1 1-4	3 9-16	.....	.....

Below are given soil and climate best adapted for the various breeds, rate of development, quality of flesh, etc., etc. The numbers in first column of preceding table refer to further description and characteristics of same breeds in paragraphs following:

1. Grass soil, mild climate, fears fog, develops rapidly and fattens easily, does not set, flesh exquisite white and delicate.

2. Calcareous soil, any climate, very rapid development, incubation nil, flesh delicate.

3. Grass, hardy in all climates, fattens quickly, good sitters, does not steal nest, flesh exquisite.
4. Any climate, fattens quickly, incubation nil, flesh very good.
5. Mild climate, dry soil, development slow, incubation good, flesh delicate.
6. Mild climate, dry soil, development slow, fattens easily, incubation nil, flesh very delicate.
7. Dry soil, any climate, rapid development, incubate rarely, delicate flesh.
8. Grass soil, any climate, pretty rapid development, incubate rarely, flesh good.
9. Dry soil, hardy in all climates, development middling, incubation good but late, good flesh.
10. Dry soil and warm climate, development middling, incubation nil, flesh delicate.
11. Hardy, dry soil, any climate, development slow, incubation excellent, good mothers, flesh fair.
12. Hardy race, any climate, require much space, development middling, incubation nil, flesh good.
13. Hardy in any climate, develop very slowly, incubation excellent, good mothers but heavy, flesh stringy.
14. Hardy in any climate, development rapid, incubation capital, good mothers, flesh excellent.
15. Very hardy race in any climate, development rapid, incubation nil, flesh delicate.
16. Hardy in any climate, development middling, incubation very good, excellent mothers, flesh good.
17. Grass soil and mild climate, develop very rapidly, incubate well, very good mothers, flesh very delicate and juicy.
18. Delicate race, sandy soil and warm climate, develop slowly, long time feathering, incubation rare, flesh delicate.
19. Any soil or climate, development middling, incubation very rare, flesh delicate.
20. Delicate breed, require grass soil, development middling, incubation nil, flesh pretty good.
21. Very hardy in any climate, develop rapidly, incubation good, most excellent mothers, flesh excellent.
22. Very hardy in any climate, develop rapidly, incubate very rarely, flesh indifferent.
23. Delicate race, fear damp, development not very rapid, incubation rare, flesh delicate.
24. Delicate race, grass soil, development middling, incubation nil, flesh good.
25. Very delicate breed, dry soil, development middling, incubation pretty good.
26. Delicate, dry soil, development middling, incubation good—must not be disturbed.
27. Sandy soil, development middling, incubation indifferent, flesh good.
28. Very hardy race in any climate, develop rapidly, excellent incubation, flesh very bad.

THE "POOR MAN'S REGION," in the Pine Barrens of the Southern States, is a belt of country more than seventeen hundred miles long and often one hundred and seventy miles broad, stretching from Richmond, Va., along the Atlantic and Gulf coasts, to beyond the western line of Louisiana. The soil is sandy and the principal tree is the long-leaf pine. These forests, while affording a valuable article of lumber, also yield pitch, tar and turpentine.

THE first proposer of secession in the United States Congress was Josiah Quincy, of Massachusetts, in 1811, who said that, if Louisiana were admitted into the Union, "it will be the right of all and the duty of some [of the States] definitely to prepare for a separation—amicably if they can, violently if they must." Mr. Poindexter, of Mississippi, called him to order as did the Speaker of the House; but on appeal the Speaker's decision was reversed, and Mr. Quincy sustained by a vote of fifty-three ayes to fifty-six noes, on the point of order.

Breeds.	Live weight in pounds.	Live weight of Hen	Age at maturity, mos.	Cost of raising to maturity.	Annual cost of keepi'g.	Av. val. of eggs laid per year.
Ducks, common	3	3	6	75	1.00	90
Ducks, Aylesbury	7	6	18	1.00	1.00	80
Ducks, Cayuga	6	5½	15	90	1.00	1.00
Ducks, Pekin	6	5½	18	1.10	1.00	75
Ducks, Rouen	7½	6½	24	1.10	1.00	80
Geese, common	8	7	12	1.25	1.50	20
Geese, African	20	18	24	1.75	2.00	30
Geese, Egyptian	7	6	12	1.00	1.50	40
Geese, Embden	18	15	30	1.75	2.00	20
Geese, Toulouse	22	20	36	2.00	2.00	40
Turkeys, common	12	10	12	1.20	1.50	50
Turkeys, black	15	12	18	1.75	1.75	50
Turkeys, bronze	24	15	36	2.00	2.00	50
Turkeys, buff	15	12	24	1.75	1.50	50
Turkeys, Narragansetts	22	14	30	1.75	1.75	50

The annual supply of eggs in the United States is estimated at over 500,000,000 dozen, and, at the low price of sixteen cents per dozen, represents a value of over $80,000,000—double the value of the product of our silver mines.

Fate of the Apostles.

The following brief history of the fate of the Apostles may be new to those whose reading has not been evangelical:

St. Matthew is supposed to have suffered martyrdom or was slain with the sword at the city of Ethiopia.

St. Mark was dragged through the streets of Alexandria, in Egypt, till he expired.

St. Luke was hanged upon an olive tree in Greece.

St. John was put into a caldron of boiling oil at Rome and escaped death. He afterward died a natural death at Ephesus in Asia.

St. James the Great was beheaded at Jerusalem.

St. James the Less was thrown from a pinnacle or wing of the temple and then beaten to death with a fuller's club.

St. Philip was hanged up against a pillar at Hieropolis, a city of Phrygia.

St. Bartholomew was flayed alive by the command of a barbarous king.

St. Andrew was bound to a cross, whence he preached unto the people till he expired.

St. Thomas was run through the body with a lance at Caromandel, in the East Indies.

St. Jude was shot to death with arrows.

St. Simon Zealot was crucified in Persia.

St. Matthias was first stoned and then beheaded.

St. Barnabas was stoned to death by Jews at Salania.

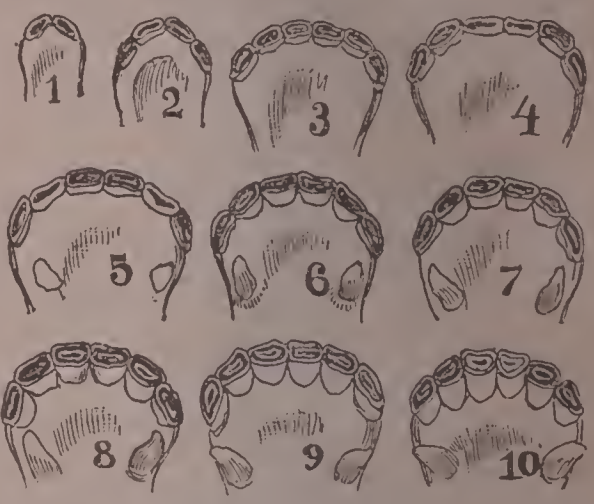
St. Paul was beheaded at Rome by the tyrant Nero.

How to Tell the Age of a Horse.

The safest way of determining the age of a horse is by the appearance of the teeth, which undergo certain changes in the course of years.

Eight to fourteen days after birth, the first middle nippers of the set of milk teeth are cut (Fig. 1), four to six weeks afterwards the pair next to them (Fig. 2), and finally, after six or eight months, the last (Fig. 3).

All these milk teeth have a well defined body and neck, and a slender fang, and on their front surface grooves of furrows, which disappear from the middle nippers at the end of one year, from the next pair in two years, and from the incisive teeth (cutters) in three years.



At the age of two the nippers become loose and fall out, in their places appear two permanent teeth, with deep, black cavities, and full, sharp edges (Fig. 4).

At the age of three, the next pair (Fig. 5) fall out.

At four years old, the corner teeth fall out (Fig. 6).

At five years old, the horse has his permanent set of teeth.

The teeth grow in length as the horse advances in years, but at the same time his teeth are worn away by use about one-twelfth of an inch every year, so that the black cavities of the center nippers below disappear in the sixth year (Fig 7), those of the next pair in the seventh year (Fig. 8), and those of the corner teeth in the eighth year (Fig. 9). Also the outer corner teeth of upper and lower jaw just meet at eight years of age.

At nine years old, cups leave the two center nippers above, and each of the two upper corner teeth has a little sharp protrusion at the extreme outer corner (Fig. 10).

At the age of ten, the cups disappear from the adjoining teeth.

At the age of eleven, the cups disappear from the corner teeth above, and are only indicated by brownish spots.

The oval form becomes broader, and changes, from the twelfth to the sixteenth year, more and more into a triangular form, and the teeth lose, finally, with the twentieth year, all regularity. There is nothing remaining in the teeth that can afterwards clearly show the age of the horse, or justify the most experienced examiner in giving a positive opinion.

The tushes, or canine teeth, conical in shape, with a sharp point, and curved, are cut between the third and fourth year, their points become more and more rounded until the ninth year, and after that, more and more dull in the course of years, and lose, finally, all regular shape. Mares have, frequently, no tusks, or only very faintly indicated.

Age of Sheep and Goats. At one year old they have eight front teeth of uniform size. At two years the two middle ones are supplanted by two large ones. At three a small tooth appears on each side. At four there are six large teeth. At five all the front teeth are large, and at six all begin to get worn.

Age of Cattle. A cow's horn is supposed to furnish a correct indication of the age of the animal, but this is not always true. For ordinary purposes, however, the following will be found approximately correct: At two years of age a circle of thicker matter begins to form on the animal's horns, which becomes clearly defined at three years of age, when another circle begins to form, and an additional circle every year thereafter. The cow's age then can be determined by adding two to the number of circles. The rings on a bull's horns do not show themselves until he is five years old—so in the case of a bull five must be added to the number of rings. Unless the rings are clear and distinct these rules will not apply. Besides, dishonest dealers sometimes file off some of the rings of old cattle.

MEDICINES FOR THE HORSE.

Name of Drug.	Action and Use.	Dose.	Antidote.
Aloes	Laxative and Tonic	½ to 1 oz	
Alum	Astringent	2 to 3 drs	
Anise Seed	Aromatic and Stomachic	½ to 2 oz	
Aqua Ammonia	Stimulant and Antacid	1 to 4 drs	Vinegar
Arsenic	Alterative and Tonic. For Paralysis, Mange, etc	1 to 5 grs	Magnesia and oil
Asafœtida	Anti-spasmodic, Coughs, etc	1 to 3 drs	
Bicarbonate of Potash	Diuretic and Antacid. For Rheumatism	3 to 5 drs	Vinegar and raw Linseed Oil
Bismuth	For Chronic Diarrhœa, etc	½ to 1 oz	
Black Antimony	Promotes the Secretions	¼ to ½ dr	Infusion of oak bark. Give also Linseed Oil
Blue Vitriol	Astringent and Tonic	½ to 1 dr	Eggs, Milk, etc
Calomel	Cathartic	10 to 40 grs	Eggs and Milk
Camphor	Anti-spasmodic	½ to 1 dr	
Cantharides	Diuretic and Stimulant	3 to 6 grs	
Carbolic Acid	Externally and Disinfectant		Eggs, soap, gruel
Castor Oil	Cathartic	½ to 1 pt	
Cayenne	Stimulant and Carminative	5 to 25 grs	
Chlorate of Potash	Diuretic. For Bloating, etc	½ to 2 drs	
Copperas	Tonic and Astringent	½ to 1½ drs	
Croton Oil	Powerful Purgative	10 to 15 d'ps	Opium
Digitalis Leaf	Sedative and Diuretic	10 to 20 grs	Stimulate
Epsom Salts	Cathartic and Febrifuge	2 to 8 oz	
Ether	Anti-spasmodic	½ to 2 oz	
Fowler's Solution	Used for Skin Diseases	1 to 4 drs	Hydrated Peroxide of Iron
Gentian Root	Tonic	1 to 2 drs	
Ginger	Tonic, Stimulant & Stomachic. For Flatulent Colic, Dyspepsia, etc	2 to 5 drs	
Glauber's Salts	Cathartic	6 to 12 ozs	
Iodide of Potassium	Diuretic and Alterative. For Rheumatism, Dropsy, Enlarged Glands, etc	½ to 1½ drs	Give freely starch or flour, with water largely
Linseed Oil, Raw	Cathartic and Nutritive	1 to 2 pts	
Magnesia	For colts as an Antacid and Laxative	¼ to 1 oz	
Mercurial Ointm't	For Mange, Itch, Lice, and other Parasites		Whites of eggs with milk, freely
Nux Vomica	Nervous Stimulant. For Paralysis	15 to 25 grs	Salaratus, followed quickly by copperas, dissolved in water
Opium	Anodyne and Anti-spasmodic. Given in Colic, Inflamation of Bowels, Diarrhœa, etc	¼ to 1 dr	Belladonna, str'g coffee, brandy & ammonia. Dash cold water on and keep horse movi'g
Prepared Chalk	Antacid	½ to 1 oz	
Quinine	Tonic. During Convalescence	15 to 50 grs	
Saltpetre	Diuretic and Febrifuge	1 to 3 drs	Linseed oil largely, raw
Soda Bicarb.	Similar to Bicarb. Potash	3 to 8 drs	
Soda Sulphite	Antiseptic and Alterative. For Blood Diseases	½ to 1 oz	
Solution of Lime	Antacid, an antidote to poisoning by acids	4 to 6 ozs	
Sp'ts of Chlorofor'e	Anodyne & Anti-spasmodic	1 to 2 ozs	

MEDICINES FOR THE HORSE.—*Continued.*

Name of Drug.	Action and Use.	Dose.	Antidote.
Strychnia	Tonic & Stimulant. For Paralysis	½ to 1 gr	Tobacco
Sulphur	Alterative and Laxative. Skin diseases, Rheu'tism	½ to 2 oz	
Sweet Sp'ts Nitre	Diuretic and Diaphoretic.	½ to 1½ oz	
Tannic Acid	Astringent	20 to 40 grs	
Tartar Emetic	Sedative and Alterative	⅛ to ½ dr	Tannic Acid
Tin. Aconite Root	Sedative. For Lung Fever, etc	15 to 35 d'ps	Small doses of Nux Vomica, stimulants largely, & keep moving
Tin. Cantharides	Stimulant and Tonic	1 to 2 drs	
Tincture Ergot	Parturient	1 to 2 oz	
Tincture Iodine	Used externally		
Tincture Iron	Tonic and Astringent. For Typhoid Diseases	½ to 1 oz	
Tr. Nux Vomica	Tonic. Stimulant in Paralysis and Dyspepsia	2 to 4 drs	See Nux Vomica
Tincture Opium	Anodyne and Anti-spasmodic	1 to 2 ozs	See Opium
White Vitriol	Astringent. For Wounds Cuts & Sores, in solution	5 to 15 grs	Milk, eggs & flour

For a colt one month old, give one twenty-fourth of the full dose for an adult horse as given above; three months old, one-twelfth; six months old, one-sixth; one year old, one-third; two years old, one-half; three years old, three-fourths.

The Seven Bibles of the World

Are the Koran of the Mohammedans, the Eddas of the Scandinavians, the Try Pitikes of the Buddhists, the Five Kings of the Chinese, the Three Vedas of the Hindoos, the Zĕ davesta, and the Scriptures of the Christians. The Koran is the most recent of these seven Bibles, and not older than the seventh century of our era. It is a compound of quotations from the Old and New Testaments, the Talmud, and the Gospel of St. Barnabas. The Eddas of the Scandinavians were first published in the fourteenth century. The Pitikes of the Buddhists contain sublime morals and pure aspirations, and their author lived and died in the sixth century before Christ. There is nothing of excellence in these sacred books not found in the Bible. The sacred writings of the Chinese are called the Five Kings, king meaning web of cloth, or the warp that keeps the threads in their place. They contain the best sayings of the best sages on the ethico-political duties of life. These sayings cannot be traced to a period higher than the eleventh century B.C. The Three Vedas are the most ancient books of the Hindoos, and it is the opinion of Max Muller, Wilson, Johnson, and Whitney that they are not older than eleven centuries B.C. The Zendavesta of the Persians is the grandest of all the sacred books next to our Bible. Zoroaster, whose sayings it contains, was born in the twelfth century B.C. Moses lived and wrote his Pentateuch fifteen centuries B.C., and, therefore, has a clear margin of 300 years older than the most ancient of the sacred writings.

CANARY BIRDS.

HOW TO KEEP THEM HEALTHY AND IN GOOD SONG.

Place the cage so that no draught of air can strike the bird.

Give nothing to healthy birds but rape, hemp, canary seed, water, cuttle-fish bone, and gravel paper or sand on floor of cage.

A bath three times a week.

The room should not be overheated.

When moulting keep warm and avoid all draughts of air.

Give plenty of German summer rape seed. A little hard boiled egg mixed with cracker, grated fine, once or twice a week, is excellent.

Feed at a certain hour in the morning.

DISEASES AND CURES.

Husk or Asthma. The curatives are aperients, such as endive, water cresses, bread and milk and red pepper.

Pip. Mix red pepper, butter and garlic and swab out the throat.

Sweating. Wash the hen in salt and water, and dry rapidly.

Costiveness. Plenty of green food and fruit.

Obstruction of the Rump Gland. Pierce with a needle. Press the inflamed matter out, and drop fine sugar over the wound.

Lice. Keep a saucer of fresh water in the cage and the bird will free itself.

Overgrown Claws or Beak. Pare carefully with a sharp knife.

Moulting. Give plenty of good food and keep warm. Saffron and a rusty nail put in their drinking water is excellent.

Loss of Voice. Feed with paste of bread, lettuce and rape seed with yoke of egg. Whisky and sugar is an excellent remedy.

What a Horse Can Draw.

On metal rails a horse can draw:

One and two-thirds times as much as on asphalt pavement.
Three and one-third times as much as on good Belgian blocks.
Five times as much as on ordinary Belgian blocks.
Seven times as much as on good cobble-stone.
Thirteen times as much as on ordinary cobble-stone.
Twenty times as much as on an earth road.
Forty times as much as on sand.

A modern compilation of engineering maxims states that a horse can drag, as compared with what he can carry on his back, in the following proportions: On the worst earthen road, three times more; on a good macadamized road, nine; on plank, twenty-five; on a stone trackway, thirty-three; and on a good railway, fifty-four times as much.

Test for Glue.

The following simple and easy test for glue is given: A weighed piece of glue (say one-third of an ounce) is suspended in water for twenty-four hours, the temperature of which is not above fifty degrees Fahrenheit. The coloring material sinks, and the glue swells from the absorption of the water. The glue is then taken out and weighed; the greater the increase in weight the better the glue. If it then be dried perfectly and weighed again, the weight of the coloring matter can be learned from the difference between this and the original weight.

WEIGHTS AND MEASURES.

TROY WEIGHT—24 grains make 1 pennyweight, 20 pennyweights make 1 ounce. By this weight, gold, silver and jewels only are weighed. The ounce and pound in this are same as in Apothecaries' weight.

APOTHECARIES' WEIGHT—20 grains make one scruple, 3 scruples make 1 dram, 8 drams make 1 ounce, 12 ounces make 1 pound.

AVOIRDUPOIS WEIGHT—6 drams make 1 ounce, 16 ounces make one pound, 25 pounds make 1 quarter, 4 quarters make 1 hundredweight, 2,000 pounds make 1 ton.

DRY MEASURE—2 pints make 1 quart, 8 quarts make 1 peck, 4 pecks make 1 bushel, 36 bushels make 1 chaldron.

LIQUID OR WINE MEASURE—4 gills make 1 pint, 2 pints make 1 quart, 4 quarts make 1 gallon, 31½ gallons make 1 barrel, 2 barrels make 1 hogshead.

TIME MEASURE—60 seconds make 1 minute, 60 minutes make 1 hour, 24 hours make 1 day, 7 days make 1 week, 4 weeks make 1 lunar month, 28, 29, 30 or 31 days make 1 calendar month (30 days make 1 month in computing interest), 52 weeks and 1 day, or 12 calendar months, make 1 year; 365 days, 5 hours, 48 minutes and 49 seconds make 1 solar year.

CIRCULAR MEASURE—60 seconds make 1 minute, 60 minutes make 1 degree, 30 degrees make 1 sign, 90 degrees make 1 quadrant, 4 quadrants or 360 degrees make 1 circle.

LONG MEASURE—DISTANCE—3 barleycorns 1 inch, 12 inches 1 foot, 3 feet 1 yard, 5½ yards 1 rod, 40 rods 1 furlong, 8 furlongs 1 mile.

CLOTH MEASURE—2¼ inches 1 nail, 4 nails 1 quarter, 4 quarters 1 yard.

MISCELLANEOUS—3 inches one palm, 4 inches 1 hand, 6 inches 1 span, 18 inches 1 cubit, 21.8 inches 1 Bible cubit, 2½ feet 1 military pace.

SQUARE MEASURE—144 square inches 1 square foot, 9 square feet 1 square yard, 30¼ square yards 1 square rod, 40 square rods 1 rood, 4 roods 1 acre.

SURVEYORS' MEASURE—7.92 inches 1 link, 25 links 1 rod, 4 rods 1 chain, 10 square chains or 160 square rods 1 acre, 640 acres 1 square mile.

CUBIC MEASURE—1,728 cubic inches 1 cubic foot, 27 cubic feet 1 cubic yard, 128 cubic feet 1 cord (wood), 40 cubic feet 1 ton (shipping), 2,150.42 cubic inches 1 standard bushel, 268.8 cubic inches 1 standard gallon, 1 cubic foot four-fifths of a bushel.

METRIC WEIGHTS—10 milligrams 1 centigram, 10 centigrams 1 decigram, 10 decigrams 1 gram, 10 grams 1 dekagram, 10 dekagrams 1 hektogram, 10 hektograms 1 kilogram.

METRIC MEASURES—(One milliliter—Cubic centimeter.)—10 milliliters 1 centiliter, 10 centiliters 1 deciliter, 10 deciliters 1 liter, 10 liters 1 dekaliter, 10 dekaliters 1 hektoliter, 10 hektoliters 1 kiloliter.

METRIC LENGTHS—10 millimeters 1 centimeter, 10 centimeters 1 decimeter, 10 decimeters 1 meter, 10 meters 1 dekameter, 10 dekameters 1 hektometer, 10 hektometers 1 kilometer.

Relative Value of Apothecaries' and Imperial Measure.

Apothecaries.	Imperial.
1 gallon equals.....	6 pints, 13 ounces, 2 drams, 23 minims.
1 pint "	16 " 5 " 18 "
1 fluid ounce equals.....	1 " 0 " 20 "
1 fluid dram "	1 " 2½ "

Handy Metric Tables.

The following tables give the equivalents of both the metric and common systems, and will be found convenient for reference:

		Approximate Equivalent.	Accurate Equivalent.
1 inch	[length]	2½ cubic centimeters	2.539
1 centimeter		0.4 inch	0.393
1 yard		1 meter	0.914
1 meter (39.37 inches)		1 yard	1.093
1 foot		30 centimeters	30.479
1 kilometer (1,000 meters)		⅝ mile	0.621
1 mile		1½ kilometers	1.600
1 gramme	[weight]	15½ grains	15.432
1 grain		0.064 gramme	0.064
1 kilogramme (1,000 grammes)		2.2 pounds avoirdupois	2.204
1 pound avoirdupois		½ kilogramme	0.453
1 ounce avoirdupois (437½ grains)		28⅓ grammes	28.349
1 ounce troy, or apothecary (480 grains)		31 grammes	31.103
1 cubic centimeter	[bulk]	1.06 cubic inch	0.060
1 cubic inch		16⅓ cubic centimeters	16.386
1 liter (1,000 cubic centimeters)		1 United States standard quart	0.946
1 United States quart		1 liter	1.057
1 fluid ounce		29½ cubic centimeters	29.570
1 hectare (10,000 square meters)	[surface]	2½ acres	2.471
1 acre		0.4 hectare	0.40

It may not be generally known that we have in the nickel five-cent piece of our coinage a key to the tables of linear measures and weights. The diameter of this coin is two centimeters, and its weight is five grammes. Five of them placed in a row will, of course, give the length of the decimeter; and two of them will weigh a decagram. As the kiloliter is a cubic meter, the key to the measure of length is also the key to the measures of capacity. Any person, therefore, who is fortunate enough to own a five-cent nickle, may carry in his pocket the entire metric system of weights and measures.

Handy Weights and Measures.

One quart of wheat flour is one pound. One quart of corn meal weighs eighteen ounces. One quart of butter, soft, weighs fourteen to sixteen ounces. One quart of brown sugar weighs from a pound to a pound and a quarter, according to dampness. One quart of white sugar weighs 2 pounds. Ten medium-sized eggs weigh one pound. A tablespoonful of salt is one ounce. Eight tablespoonfuls make a gill. Two gills, or sixteen tablespoonfuls, are half a pint. Sixty drops are one teaspoonful. Four tablespoonfuls are one wineglassful. Twelve tablespoonfuls are one teacupful. Sixteen tablespoonfuls, or half a pint, are one tumblerful.

The Meaning of Measures—A square mile is equal to 640 acres. A square acre is 208.71 feet on one side. An acre is 43,560 square feet. A league, 3 miles. A span, 10⅞ inches. A hand, 4 inches. A palm, 3 inches. A great cubit, 11 inches. A fathom, 6 feet. A mile, 5,280 feet.

Domestic and Drop Measures Approximated—A teaspoonful, one fluid dram 4 grams; a dessertspoonful, two fluid drams 3 grams; a tablespoonful, half fluid ounce 16 grams; a wineglassful, two fluid ounces 64 grams; a tumblerful, half pint 256 grams.

The original Mrs. Partington was a respectable old lady who lived at Sidmouth, in Devonshire, England. Her cottage was on the beach, and during a terrific storm (November, 1824) the sea rose to such a height as even now and then to invade the old lady's residence. The old lady persistently mopped out the water with such help as she could command, until finally she was compelled to retreat to an upper story.

PRACTICAL CALCULATIONS.

Short Cuts in Arithmetic—Handy Tables for Ready Reckoning.

TO ASCERTAIN THE WEIGHT OF CATTLE—Measure the girt close behind the shoulder, and the length from the fore part of the shoulder-blade along the back to the bone at the tail, which is in a vertical line with the buttock, both in feet. Multiply the square of the girt, expressed in feet, by ten times the length, and divide the product by three; the quotient is the weight, nearly, of the fore quarters, in pounds avoirdupois. It is to be observed, however, that in very fat cattle the fore quarters will be about one-twentieth more, while in those in a very lean state they will be one-twentieth less than the weight obtained by the rule.

RULES FOR MEASURING CORN IN CRIB, VEGETABLES, ETC., AND HAY IN MOW—This rule will apply to a crib of any size or kind. Two cubic feet of good, sound, dry corn in the ear will make a bushel of shelled corn. To get, then, the quantity of shelled corn in a crib of corn in the ear, measure the length, breadth and height of the crib, inside the rail; multiply the length by the breadth and the product by the height, then divide the product by two, and you have the number of bushels of shelled corn in the crib.

To find the number of bushels of apples, potatoes, etc., in a bin, multiply the length, breadth and thickness together, and this product by eight, and point off one figure in the product for decimals.

To find the amount of hay in a mow, allow 512 cubic feet for a ton, and it will come out very generally correct.

TO MEASURE BULK WOOD—To measure a pile of wood, multiply the length by the width, and that product by the height, which will give the number of cubic feet. Divide that product by 128, and the quotient will be the number of cords. A standard cord of wood, it must be remembered, is four feet thick; that is, the wood must be four feet long. Farmers usually go by surface measure, calling a pile of stove wood eight feet long and four feet high a cord. Under such circumstances thirty-two feet would be the divisor.

HOW TO MEASURE A TREE—Very many persons, when looking for a stick of timber, are at a loss to estimate either the height of the tree or the length of timber it will cut. The following rule will enable any one to approximate nearly to the length from the ground to any position desired on the tree: Take a stake, say six feet in length, and place it against the tree you wish to measure. Then step back some rods, twenty or more if you can, from which to do the measuring. At this point a light pole and a measuring rule are required. The pole is raised between the eyes and the tree, and the rule is brought into position against the pole. Then by sighting and observing what length of the rule is required to cover the stake at the tree, and what the entire tree, dividing the latter length by the former and multiplying by the number of feet the stake is long, you reach the approximate height of the tree. For example, if the stake at the tree be six feet above ground and one inch on your rule corresponds exactly with this, and if then the entire height of the tree corresponds exactly with say nine inches on the rule, this would show the tree to possess a full height of fifty-four feet. In practice it will thus be found an easy matter to learn the approximate height of any tree, building, or other such object.

TO MEASURE CASKS OR BARRELS—Find mean diameter by adding to head diameter two-thirds (if staves are but slightly curved, three-fifths) of difference between head and bung diameters, and dividing by two. Multiply square of mean diameter in inches by .7854, and the product by the height of the cask in inches. The result will be the number of cubic inches. Divide by 231 for standard or wine gallons, and by 282 for beer gallons.

GRAIN MEASURE—To find the capacity of a bin or wagon-bed, multiply the cubic feet by .8 (tenths). For great accuracy, add ⅓ of a bushel for every 100 cubic feet. To find the cubic feet, multiply the length, width and depth together.

CISTERN MEASURE—To find the capacity of a round cistern or tank, multiply the square of the average diameter by the depth, and take 3-16 of

the product. For great accuracy, multiply by .1865. For square cisterns or tanks, multiply the cubic feet by .2⅜. The result is the contents in barrels.

LAND MEASURE—To find the number of acres in a body of land, multiply the length by the width (in rods), and divide the product by 160. When the opposite sides are unequal, add them, and take half the sum for the mean length or width.

MEASURES OF CAPACITY—The following table, showing contents of boxes, will often be found convenient, taking inside dimensions:

24 in. x 24 in. x 14.7 will contain a barrel of 31½ gallons.
15 in. x 14 in. x 11 in. will contain 10 gallons.
8¼ in. x 7 in. x 4 in. will contain a gallon.
4 in. x 4 in. x 3.6 in. will contain a quart.
24 in. x 28 in. x 16 in. will contain 5 bushels.
16 in. x 12 in. x 11.2 in. will contain a bushel.
12 in. x 11.2 in. x 8 in. will contain a half bushel.
7 in. x 6.4 in. x 12 in. will contain a peck.
8.4 in. x 8 in. x 4 in. will contain a half peck, or 4 dry quarts.
6 in. x 5 3-5 in., and 4 in. deep, will contain a half gallon.
4 in. x 4 in., and 2 1-10 in. deep, will contain a pint.

Food for Stock.

One hundred pounds of good hay for stock are equal to: Beets, white silesia, 669; turnips, 469; rye straw, 429; clover, red, green, 373; carrots, 371; mangolds, 368½; potatoes, kept in pit, 350; oat straw, 317; potatoes, 360; carrot leaves (tops), 135; hay, English, 100; Lucerne, 89; clover, red, dry, 88; buckwheat, 78½; corn, 62½; oats, 59; barley, 58; rye, 53½; wheat, 44½; oil-cake, linseed, 43; peas, dry, 37½; beans, 28.

Number of Shrubs, Plants or Trees in an Acre.

Distances apart.	No. of Plants.	Distances apart.	No. of Plants.	Distances apart.	No. of Plants.
1 by 1	43,560	5 by 2	4,356	15 by 15	193
1½ " 1½	19,360	5 " 3	2,904	16 " 16	170
2 " 1	21,780	5 " 4	2,178	17 " 17	150
2 " 2	10,890	5 " 5	1,742	18 " 18	134
2½ " 2½	6,969	5½ " 5½	1,417	19 " 19	120
3 " 1	14,520	6 " 6	1,210	20 " 20	108
3 " 2	7,260	6½ " 6½	1,031	24 " 24	75
3 " 3	4,840	7 " 7	888	25 " 25	69
3½ " 3½	3,555	8 " 8	680	27 " 27	59
4 " 1	10,890	9 " 9	537	30 " 30	48
4 " 2	5,445	10 " 10	435	40 " 40	27
4 " 3	3,630	11 " 11	360	50 " 50	17
4 " 4	2,722	12 " 12	302	60 " 60	12
4½ " 4½	2,151	13 " 13	257	66 " 66	10
5 " 1	8,712	14 " 14	222		

The city of Ghent, Belgium, stands on twenty-six islands, connected with each other by eighty bridges. The city of Venice is built on eighty islands, connected by nearly 400 bridges. In Venice canals serve for streets and gondolas for carriages.

Bricks and common pottery ware owe their red color to the iron naturally contained in the clay of which they are formed, the iron, by the action of the heat, being converted into red oxide of iron. Some varieties of clay, like that found near Milwaukee, contain little or no iron, and bricks made from such clay are consequently of a light yellow color.

Quantity of Seeds Required for Planting.

	Seeds, per ounce.	Length of Drill, per oz.	Vitality. Years.
Asparagus	1,000 to 1,200	50 feet	4 to 6
Beet	1,200 to 1,500	100 "	6 " 8
Carrot	20,000 to 24,000	200 "	1 " 3
Cabbage, Cauliflower	8,000 to 12,000	Transplant	4 " 6
Celery	50,000 to 60,000	Transplant	3 " 5
Egg plant	5,000 to 6,000	Transplant	5 " 6
Endive	20,000 to 24,000	Transplant	8 " 10
Lettuce	25,000 to 30,000	400 feet	5 " 6
Okra	500 to 600	50 "	5 " 6
Onion	7,000 to 8,000	200 "	1 " 2
Parsnip	5,000 to 6,000	200 "	1 " 2
Radish	3,000 to 4,000	100 "	4 " 5
Salsify	2,500 to 3,000	100 "	4 " 5
Spinach	2,000 to 3,000	100 "	4 " 5
Tomato	About 20,000	Transplant	4 " 5
Turnip	8,000 to 12,000	200 feet	6 " 7

Number of Pounds to the Bushel, Legal Weight, in the Different States.

States.	Wheat.	Rye.	Oats.	Barley.	Buckwheat.	Shelled Corn.	Corn on the Cob.	Corn Meal.	Potatoes.	Sweet Potatoes.	Onions.	Beans.	Peas.	Dried Apples.	Anthracite Coal.
Arkansas	60	56	32	48	52	....	70	50	60	50	57	60	46	24	80
California	65	54	32	50	40	52	....	....	....	....	....	....	....	....	....
Connecticut	60	56	32	48	48	56	....	50	60	....	50	60	60	....	....
Georgia	60	56	32	47	52	56	70	48	60	55	57	60	60	24	80
Illinois	60	56	32	48	52	56	70	48	60	55	57	60	....	24	80
Indiana	60	56	..	48	50	56	68	50	60	....	48	60	....	25	....
Iowa	60	56	32	48	52	56	70	....	60	46	57	60	....	24	80
Kansas	60	56	32	48	50	56	70	50	60	50	57	60	....	24	80
Kentucky	60	56	32	47	55	55	70	50	60	55	57	60	60	24	76
Maine	60	50	30	48	48	56	....	50	60	....	52	64	60	....	....
Massachusetts	60	56	32	48	48	56	....	50	60	56	52	....	....	....	....
Michigan	60	56	32	48	48	56	70	50	60	56	54	60	60	22	....
Minnesota	60	56	32	48	42	56	....	....	60	....	....	....	....	28	....
Missouri	60	56	32	48	52	56	....	....	60	....	57	60	....	24	....
New Hampshire	60	56	32	..	..	56	....	56	60	....	....	60	60	....	....
New Jersey	60	56	30	48	50	56	....	....	60	54	57	60	60	25	....
New York	60	56	32	48	48	56	....	....	60	....	....	62	60	....	....
North Carolina	60	56	30	48	50	54	....	46	....	....	....	....	50	....	....
Ohio	60	56	33	48	50	56	70	....	60	50	50	60	60	22	....
Pennsylvania	60	56	32	47	48	56	....	....	56	....	....	....	....	....	....
Rhode Island	..	56	32	48	..	56	....	50	60	....	50	....	....	....	....
South Carolina	60	56	33	48	56	56	70	50	60	50	57	60	60	26	....
Tennessee	..	56	32	48	50	56	72	50	60	50	56	60	60	26	....
Vermont	60	56	32	48	46	52	....	....	60	....	56	60	60	....	....
Virginia	60	56	32	48	52	56	70	50	60	56	57	60	60	28	80
Wisconsin	60	56	32	48	50	56	70	....	60	....	50	60	....	28	....

ANTS never sleep. Emerson mentions this as "a recently observed fact."

Barbed Wire Required for Fences.

Estimated number of pounds of barbed wire required to fence space or distances mentioned, with one, two or three lines of wire, based upon each pound of wire measuring one rod (16½ feet).

	1 Line.	2 Lines.	3 Lines.
1 square acre	50⅔ lbs.	101⅓ lbs.	152 lbs.
1 side of a square acre	12⅔ lbs.	25⅓ lbs.	38 lbs.
1 square half-acre	36 lbs.	72 lbs.	108 lbs.
1 square mile	1280 lbs.	2560 lbs.	3840 lbs.
1 side of a square mile	320 lbs.	640 lbs.	960 lbs.
1 rod in length	1 lb.	2 lbs.	3 lbs.
100 rods in length	100 lbs.	200 lbs.	300 lbs.
100 feet in length	6 1-16 lbs.	12⅛ lbs.	18 3-16 lbs.

To Measure Corn or Similar Commodity on a Floor—Pile up the commodity in the form of a cone; find the diameter in feet; multiply the square of the diameter by .7854, and the product by one-third the height of the cone in feet; from this last product deduct one-fifth of itself, or multiply it by .803564, and the result will be the number of bushels.

Contents of Fields and Lots—An acre is 43,560 square feet. The following table will assist farmers in making an accurate estimate of the amount of land in different fields under cultivation:

10	rods	×	16	rods	= 1	A.	100 ft.	×	108 9/10 ft.	= ¼	A.
8	"	×	20	"	= 1	"	25 "	×	100 "	= .0574	"
5	"	×	32	"	= 1	"	25 "	×	110 "	= .0631	"
4	"	×	40	"	= 1	"	25 "	×	120 "	= .0688	"
5	yards	×	968	"	= 1	"	25 "	×	125 "	= .0717	"
10	"	×	484	yds	= 1	"	25 "	×	150 "	= .109	"
20	"	×	242	"	= 1	"	2178	square feet		= .05	"
40	"	×	121	"	= 1	"	4356	"	"	= .10	"
80	"	×	60½	"	= 1	"	6534	"	"	= .15	"
70	"	×	69½	"	= 1	"	8712	"	"	= .20	"
220	feet	×	198	feet	= 1	"	10890	"	"	= .25	"
440	"	×	99	"	= 1	"	13068	"	"	= .30	"
110	"	×	369	"	= 1	"	15246	"	"	= .35	"
60	"	×	726	"	= 1	"	17424	"	"	= .40	"
120	"	×	363	"	= 1	"	19603	"	"	= .45	"
240	"	×	181½	ft.	= 1	"	21780	"	"	= .50	"
200	"	×	108 9/10	"	= ½	"	32670	"	"	= .75	"
100	"	×	145 2/10	"	= ⅓	"	34848	"	"	= .80	"

There is a lake of pitch in the island of Trinidad, about a mile and a half in circumference. While the asphaltum near the shores is sufficiently hard at most seasons to sustain men and quadrupeds, it grows soft and warm toward the center, and there it is in a boiling state.

GRADE PER MILE—The following table will show the grade per mile as thus indicated:

An inclination of—

1	foot	in	15	is	352	feet	per	mile	1 foot in 40 is 132 feet per mile
1	"		20	is	264	"		"	1 " 50 is 106 " "
1	"		25	is	211	"		"	1 " 100 is 53 " "
1	"		30	is	176	"		"	1 " 125 is 42 " "
1	"		35	is	151	"		"	

TO FIND THE QUANTITY OF LUMBER IN A LOG—Multiply the diameter in inches at the small end by one-half the number of inches, and this product by the length of the log in feet, which last product divide by 12.

Example. How many feet of lumber can be made from a log 30 inches in diameter and 14 feet long?

$30 \times 15 = 450 \times 14 = 6300 \div 12 = 525$ feet. Ans.

TO TELL THE SOUNDNESS OF TIMBER—Apply the ear to the middle of one of the ends, while another party strikes the other end. The blow will be clearly and distinctly heard, however long the beam may be, if the wood is sound and of good quality, but if decay has set in, the sound will be muffled and indistinct. The toughest part of a tree will always be found on the side next the north.

THE NUMBER OF CUBIC FEET IN A ROUND LOG OF UNIFORM DIAMETER—Square the diameter, in inches, multiply by .7854, and multiply this product by the length in feet, divide by 144, and the quotient is the number of cubic feet.

NUMBER OF CUBIC FEET IN THE TRUNK OF A STANDING TREE—Find the circumference in inches, divide by 3.1416, square the quotient, multiply by the length in feet, divide by 144, deduct about one-tenth for thickness of bark, and the result will be, approximately, the number of cubic feet.

Following are some curious facts about fishes. While naturalists have generally accepted Cuvier's view that the existence of fishes is silent, emotionless and joyless, recent observations tend to show that many fishes emit vocal sounds. The *anabas scandens*, the climbing perch of India, quits the water and wanders over banks for considerable distances, and is even said to climb trees and bushes. At Tranquebar, Hindoostan, may be seen the strange spectacle of fish and shell-fish dwelling high on lofty trees. The perch there climbs up tall fan-palms in pursuit of certain shell-fish which form his favorite food. Covered with viscid slime, he glides smoothly over the rough bark. Spines, which he may sheathe and unfold at will, serve him like hands to hang by, and with the aid of side fins and a powerful tail he pushes himself upward. One species of fish, the sticklebacks, are known to build nests. There are several varieties of this fish, all natives of fresh water with one or two exceptions. They are found in the Ottawa River. The cyprinodon is a sightless fish which gropes in the dreary waters of the Mammoth Cave of Kentucky.

ABRAHAM'S purchase of the cave of Machpelah is the first recorded commercial transaction.

BOARD AND PLANK MEASUREMENT AT SIGHT.

This table gives the square feet and inches in boards or planks from 3 to 25 inches wide, and 4 to 20 feet long. If a board be longer than 20 feet, or wider than 25 inches, unite two of the numbers.

LENGTH, -	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.	9 ft.	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.	19 ft.	20 ft.
WIDTH.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft in.
3 in.....	1..00	1..03	1..06	1..09	2..00	2..03	2..06	2..09	3..00	3..03	3..06	3..09	4..00	4..03	4..06	4..09	5..00
4 in.....	1..04	1..08	2..00	2..04	2..08	3..00	3..04	3..08	4..00	4..04	4..08	5..00	5..04	5..07	6..00	6..04	6..08
5 in.....	1..08	2..01	2..06	2..11	3..04	3..09	4..02	4..07	5..00	5..05	5..10	6..03	6..08	7..01	7..03	7..11	8..04
6 in.....	2..00	2..06	3..00	3..06	4..00	4..06	5..00	5..06	6..00	6..06	7..00	7..06	8..00	8..06	9..00	9..06	10..00
7 in.....	2..04	2..11	3..06	4..01	4..08	5..03	5..10	6..05	7..00	7..07	8..02	8..09	9..04	9..11	10..06	11..01	11..08
8 in	2..08	3..04	4..06	4..08	5..04	6..00	6..08	7..04	8..00	8..08	9..04	10..00	10..08	11..04	12..00	12..08	13..04
9 in.....	3..00	3..09	4..00	5..03	6..00	6..09	7..06	8..03	9..00	9..09	10..06	11..03	12..00	12..09	13..06	14..03	15..00
10 in.....	3..04	4..02	5..06	5..10	6..08	7..06	8..04	9..02	10..00	10..10	11..08	12..06	13..04	14..02	15..00	15..10	16..08
11 in.....	3..08	4..07	5..00	6..05	7..04	8..03	9..02	10..01	11..00	11..11	12..10	13..09	14..08	15..07	16..06	17..05	18..04
12 in.....	4..00	5..00	6..00	7..00	8..00	9..00	10..00	11..00	12..00	13..00	14..00	15..00	16..00	17..00	18..00	19..00	20..00
13 in.....	4..04	5..05	6..00	7..07	8..08	9..09	10..10	11..11	13..00	14..01	15..02	16..03	17..04	18..05	19..06	20..07	21..08
14 in.....	4..08	5..10	7..06	8..02	9..04	10..06	11..08	12..10	14..00	15..02	16..04	17..06	18..08	19..10	21..00	22..02	23..04
15 in.....	5..00	6..03	7..00	8..09	10..00	11..03	12..06	13..09	15..00	16..03	17..06	18..09	20..00	21..03	22..06	23..09	25..00
16 in.....	5..04	6..08	8..00	9..04	10..08	12..00	13..04	14..08	16..00	17..04	18..08	20..00	21..04	22..08	24..00	25..04	26..08
17 in.....	5..08	7..01	8..06	9..11	11..04	12..09	14..02	15..07	17..00	18..05	19..10	21..03	22..08	24..01	25..06	26..11	28..04
18 in.....	6..00	7..06	9..00	10..06	12..00	13..06	15..00	16..06	18..00	19..06	21..00	22..06	24..00	25..06	27..00	28..06	30..00
19 in..... ..	6..04	7..11	9..06	11..01	12..08	14..03	15..10	17..05	19..00	20..07	22..02	23..09	25..04	26..11	28..06	30..01	31..08
20 in.....	6..08	8..04	10..00	11..08	13..04	15..00	16..08	18..04	20..00	21..08	23..04	25..00	26..08	28..04	30..00	31..08	33..04
21 in.....	7..00	8..09	10..06	12..03	14..00	15..09	17..06	19..03	21..00	22..09	24..06	26..03	28..00	29..09	31..06	33..03	35..00
22 in.....	7..04	9..02	11..00	12..10	14..08	16..06	18..04	20..02	22..00	23..10	25..08	27..06	29..04	31..02	33..00	34..10	36..08
23 in..... ...	7..08	9..07	11..06	13..05	15..04	17..03	19..02	21..01	23..00	24..11	26..10	28..09	30..08	32..07	34..06	36..05	38..04
24 in.....	8..00	10..00	12..00	14..00	16..00	18..00	20..00	22..00	24..00	26..00	28..00	30..00	32..00	34..00	36..00	38..00	40..00
25 in.....	8..04	10..05	12..06	14..07	16..08	18..09	20..10	22..11	25..00	27..01	29..02	31..03	33..04	35..05	37..06	39..07	41..08

EXPLANATION.—To ascertain the number of feet, multiply the number of feet in length by the number of inches in width, and divide the product by 12; the result will be the number in feet and inches. Thus, multiply 9 inches wide by 26 feet long, and the result will be 234. Divide this by 12 and we have the product 19 feet and 6 inches.

Scantling and Timber Measure Reduced to One-Inch Board Measure.

To ascertain the number of feet of scantling or timber, say 18 feet long and 2 by 3 inches: Find 2 by 3 in the top columns, and 18 in the left hand column, and under 2 by 3 and against 18 is 9 feet. If the scantling is longer than contained in the table, add two lengths together. If shorter, take part off same length.

Feet.	THICKNESS AND WIDTH IN INCHES.															
	2x2	2x3	2x4	2x5	2x6	2x7	2x8	2x9	3x3	3x4	3x5	3x6	3x7	3x8	3x9	4x4
6	2.	3.	4.	5.	6.	7.	8.	9.	4.6	6.	7.6	9.	10.6	12.	13.6	8.
7	2.4	3.6	4.8	5.10	7.	8.2	9.4	10.6	5.3	7.	8.9	10.6	12.3	14.	15.9	9.4
8	2.8	4.	5.4	6.8	8.	9.4	10.8	12.	6.	8.	10.	12.	14.	16.	18.	10.
9	3.	4.6	6.	7.6	9.	10.6	12.	13.6	6.9	9.	11.3	13.6	15.9	18.	20.3	12.
10	3.4	5.	6.8	8.4	10.	11.8	13.5	15.	7.6	10.	12.6	15.	17.6	20.	22.6	13.4
11	3.8	5.6	7.4	9.2	11.	12.10	14.8	16.6	8.3	11.	13.9	16.6	19.3	22.	24.9	14.8
12	4.	6.	8.	10.	12.	14.	16.	18.	9.	12.	15.	18.	21.	24.	27.	16.
13	4 4	6.6	8.8	10.10	13.	15.2	17.4	19.6	9.9	13.	16.3	19.6	22.9	26.	29.3	17.4
14	4.8	7.	9.4	11.8	14.	16.4	18.8	21.	10.6	14.	17.6	21.	24.6	28.	31.6	18.8
15	5.	7.6	10.	12.6	15.	17.6	20.	22.6	11.3	15.	18.9	22.6	26.3	30.	33.9	20.
16	5.4	8.	10.8	13.4	16.	18.8	21.4	24.	12	16.	20.	24.	28.	32.	36.	21.4
17	5.8	8.6	11.4	14.2	17.	19.10	22.8	25.6	12.9	17.	21.3	25.6	29.9	34.	38.3	22.8
18	6.	9.	12.	15.	18.	21.	24.	27.	13.6	18.	22.6	27.	31.6	36.	40.6	24.
19	6.4	9.6	12.8	15.10	19.	22.2	25.4	28.6	14.3	19.	23.9	28.6	33.3	38.	42.9	24.4
20	6.8	10.	13.4	16.8	20.	23.4	26.8	30.	15.	20.	25.	30.	35.	40.	45.	26.8
21	7.	10.6	14.	17.6	21.	24.6	28.	31.6	15.9	21.	26.3	31.6	36.9	42.	47.3	28.
22	7.4	11.	14.8	18.4	22.	25.8	29.4	33.	16.6	22.	27.6	33.	38.6	44.	49.6	29.4
23	7.8	11.6	15.4	19.2	23.	26.10	30.8	34.6	17.3	23.	28.9	34.6	40.3	46.	51.9	30.8
24	8.	12.	16.	20.	24.	28.	32.	36.	18.	24.	30.	36.	42.	48.	54.	32.
25	8.4	12.6	16.8	20 10	25.	29.2	33.4	37.6	18.9	25.	31.3	37.6	43.9	50.	56.3	33.4
30	10.	15.	20.	25.	30.	35.	40.	45.	22.6	30.	37.6	45.	52.6	60.	67.6	40.
34	11.4	17.	22.8	28.4	34.	39.3	45.4	51.	25.6	34.	42.6	51.	59.6	68.	76.6	45.4
40	13.4	20.	26.8	33.4	40.	46.8	53.4	60.	30.	40.	50.	60.	70.	80.	90.	53.

Feet.	THICKNESS AND WIDTH IN INCHES.														
	5x4	4x6	4x7	4x8	4x9	5x5	5x6	5x7	5x8	5x9	6x6	6x7	6x8	6x9	6x10
6	10.	12.	14.	16.	18.	12.6	15.	17.6	20.	22.6	18.	21.	24.	27.	30.
7	11.8	14.	16.4	18.8	21.	14.7	17.6	20.5	23.4	26.3	21.	24.6	28.	31.6	35.
8	13.4	16.	18.8	21.4	24.	16.8	20.	23.4	26.8	30.	24.	28.	32.	36.	40.
9	15.	18.	21.	24	27.	18.9	22.6	26.3	30.	33.9	27.	31.6	36.	40.6	45.
10	16.8	20.	23.4	26.8	30.	20.10	25.	29.2	33.4	37 6	30.	35.	40.	45.	50.
11	18.4	22.	25.8	29.4	33.	22.11	27.6	32.1	36.8	41.3	33.	38.6	44.	49.6	55.
12	20.	24.	28.	32.	36.	25.	30.	35.	40.	45.	36.	42.	48.	54.	60.
13	21.8	26.	30.4	34.8	39.	27.1	32.6	37.11	43.4	48.9	39.	45.6	52.	58.6	65.
14	23.4	28.	32.8	37.4	42.	29.2	35.	40.10	46.8	52.6	42.	49.	56.	63.	70.
15	25.	30.	35.	40.	45.	31.3	37.6	43.9	50.	56.3	45.	52.6	60.	67.6	75.
16	26.8	32.	37.4	42.8	48.	33.4	40.	46.8	53.4	60.	48.	56.	64	72.	80.
17	28.4	34.	39.8	45.4	51.	35 5	42.6	49.7	56.8	63.9	51.	59 6	68.	76.6	85.
18	30.	36.	42.	48.	54.	37.6	45.	52.6	60.	67.6	54.	63.	72.	81.	90.
19	31.8	38.	44.4	50.8	57.	39.7	47.6	55.5	63.4	71.3	57	66.6	76.	85.6	95.
20	33.4	40.	46.8	53.4	60.	41.8	50.	58.4	66.8	75.	60	70.	80.	90.	100.
21	35.	42.	49.	56.	63.	43.9	52.6	61.3	70.	78.9	63	73.6	84.	94.6	105.
22	36.8	44.	51.4	58.8	66.	45.10	55.	64.2	73.4	82.6	66.	77.	88.	99.	110.
23	38.4	46.	53.8	61.4	69.	47.11	57.6	67.1	76.8	86.3	69.	80.6	92.	103.6	115.
24	40.	48.	56.	64.	72.	50.	60.	70.	80.	90.	72.	84.	96.	108.	120.
25	41.8	50.	58.4	66.8	75.	52.1	62.6	72.11	83.4	93.9	75.	87.6	100.	112.6	125.
30	50.	60.	70.	80.	90.	62.6	75.	87.6	100.	112.6	90.	105.	120.	135.	150.
34	56.8	68.	79.4	90.8	102.	70.10	85.	99.2	113.4	127.6	102.	119.	136.	153.	170.
40	66.8	80.	93.4	106.8	120.	83.4	100.	116.8	133.4	150.	120.	140.	160.	180.	200.

Logs Reduced to Inch Board Measure

Find the length of the log in feet in the left hand column, and its mean diameter in inches (found by adding the two end diameters and dividing their sum by two) at the heads of the other columns, and trace them until they meet, and the figures so found will express the diameter of feet board measure of inch boards the log will measure.

L. Feet...	Diam. 12	Diam. 13	Diam. 14	Diam. 15	Diam. 16	Diam. 17	Diam. 18	Diam. 19	Diam. 20	Diam. 21	Diam. 22	Diam. 23	Diam. 24	Diam. 25	Diam. 26	Diam. 27	Diam. 28
10	49	61	72	89	99	116	133	150	175	190	209	235	252	287	313	342	363
11	54	67	79	98	109	127	147	165	192	209	230	259	278	315	344	377	400
12	59	73	86	107	119	139	160	180	210	228	251	283	303	344	373	411	436
13	64	79	93	116	129	150	173	195	227	247	272	306	328	373	408	445	473
14	69	85	100	125	139	162	187	210	245	266	292	330	353	401	439	479	509
15	74	91	107	134	149	173	200	225	262	285	313	353	379	430	469	514	545
16	79	97	114	142	159	185	213	240	280	304	334	377	404	459	500	548	582
17	81	103	122	151	168	196	227	255	297	323	355	400	429	478	531	582	618
18	88	109	129	160	178	208	240	270	315	342	376	424	454	516	562	616	654
19	93	116	136	169	188	219	253	285	332	361	397	447	480	545	594	650	692
20	98	122	143	178	198	232	267	300	350	380	418	470	505	573	625	684	728
21	103	128	150	187	208	243	280	315	368	399	439	495	530	602	656	719	764
22	108	134	157	196	218	255	293	330	385	418	460	518	555	631	688	753	800
23	113	140	164	205	228	266	307	345	403	437	480	542	581	659	719	787	837
24	118	146	172	214	238	278	320	360	420	456	501	566	606	688	750	821	873
25	123	152	179	223	248	289	333	375	438	475	522	589	631	717	781	856	910

L. Feet...	Diam. 29	Diam. 30	Diam. 31	Diam. 32	Diam. 33	Diam. 34	Diam. 35	Diam. 36	Diam. 37	Diam. 38	Diam. 39	Diam. 40	Diam. 41	Diam. 42	Diam. 43
10	381	411	448	460	490	500	547	577	644	669	700	752	795	840	872
11	419	451	448	506	539	550	602	634	708	734	770	828	874	924	959
12	457	493	532	552	588	600	657	692	772	801	840	903	954	1007	1046
13	495	534	570	598	637	650	712	750	836	868	910	978	1033	1091	1135
14	533	575	622	644	686	700	766	807	901	934	980	1053	1113	1175	1222
15	571	616	666	690	735	750	821	865	965	1001	1050	1129	1192	1259	1309
16	609	657	710	736	784	800	876	923	1029	1068	1120	1204	1272	1343	1396
17	647	698	755	782	833	850	931	980	1094	1134	1190	1279	1351	1427	1485
18	685	739	799	828	882	900	985	1038	1158	1201	1260	1354	1431	1511	1571
19	723	780	843	874	931	950	1040	1096	1222	1268	1330	1430	1510	1595	1658
20	761	821	888	920	980	1000	1095	1152	1287	1335	1400	1505	1590	1679	1745
21	800	863	932	966	1029	1050	1150	1210	....	....	.....	.....	.....	... .	.....
22	838	904	976	1012	1078	1100	1204	1268	....	....	.....	.....	.....	.....	.....
23	876	945	1021	1058	1127	1150	1259	1322	...	...	.....	.....	.....	.....	.....
24	914	986	1065	1104	1176	1200	1314	1380	....	...	.....	.....	.....	.....	.....
25	952	1027	1109	1150	1225	1250	1369	1438	....	....	.....	.....	.....	.....	.....

THE Falls of Niagara have cut a channel through the solid rocks 200 feet deep, 1,200 to 2,000 feet wide and seven miles long. The evidence is conclusive that the falls were formerly at Queenstown, seven miles below their present situation. It has been shown that they have receded not more than a foot a year for the past half century.

ALEXANDER THE GREAT was born in Europe, died in Asia, and was buried in Africa. The preparations for his funeral consumed two years' time. The immense car containing the golden sarcophagus was drawn by sixty-four white mules, richly caparisoned, a distance of a thousand miles—from the Euphrates to the Nile.

Table For Gold Miners.

To ascertain the quantity of gold in any bulk of ore it is not necessary to reduce the mass. A proportional reduction will suffice, and the following table is based on trials of four hundred grains of ore:

If 400 Grains of Ore give Fine Gold,	One Ton of Ore Will Yield			If 400 Grains of Ore give Fine Gold,	One Ton of Ore Will Yield		
Grains.	Oz.	Dwts.	Grs.	Grains.	Oz.	Dwts.	Grs.
.001	0	1	15	.200	16	6	16
.002	0	3	6	.300	24	10	0
.003	0	4	21	.400	32	13	8
.004	0	6	12	.500	40	16	16
.005	0	8	4	.600	49	0	0
.006	0	9	19	.700	57	3	8
.007	0	11	10	.800	65	6	16
.008	0	13	1	.900	73	10	0
.009	0	14	16	1.000	81	13	8
.010	0	16	8	2.000	163	16	16
.020	1	12	16	3.000	245	0	0
.030	2	9	0	4.000	326	13	8
.040	3	5	8	5.000	408	6	16
.050	4	1	16	6.000	490	0	0
.060	4	18	0	7.000	570	13	8
.070	5	14	8	8.000	653	6	16
.080	6	10	16	9.000	735	0	0
.090	7	7	0	10.000	816	13	8
.100	8	3	8	20.000	1633	6	16

The sayings of the Seven Wise Men are the famous mottoes inscribed in the temple of Apollo at Delphi: Solon of Athens—"Know thyself." Chilo of Sparta—"Consider the end." Thales of Miletus—"Suretyship is the precursor of ruin." Bias of Priene—"Most men are bad." Cleobulus of Lindus—"Avoid excess." Pittacus of Mitylene—"Know thy opportunity." Periander of Corinth—"Nothing is impossible to industry."

The "Wandering Jew" was last seen in the seventeenth century. On January 1, 1644, he appeared at Paris and created a great sensation among all ranks. He claimed to have lived sixteen hundred years and to have traveled through all regions of the world. He was visited by many prominent personages, and no one could accost him in a language of which he was ignorant. He replied readily and without embarrassment to any questions propounded, and he was never confounded by any amount of cross-questioning. He seemed familiar with the history of persons and events from the time of Christ, and claimed an acquaintance with all the celebrated characters of sixteen centuries. Of himself he said that he was usher of the court of judgment in Jerusalem, where all criminal cases were tried at the time of our Saviour; that his name was Michab Ader; and that for thrusting Jesus out of the hall with these words, "Go, why tarriest thou?" the Messiah answered him, "I go, but tarry thou till I come," thereby condemning him to live till the day of judgment. The learned looked upon him as an impostor or madman, yet took their departure bewildered and astonished.

NAILS AND SPIKES.

SIZE, LENGTH AND NUMBER TO POUND.

ORDINARY.

Size.	Length. Inches.	No. to Lb.
2d	7/8	716
3 fine	1 1/16	588
3	1 1/16	448
4	1 3/8	336
5	1 3/4	216
6	2	166
7	2 1/4	118
8	2 1/2	94
10	2 3/4	72
12	3 1/8	50
20	3 3/4	32
30	4 1/4	20
40	4 3/4	17
50	5	14
60	5 1/2	10

LIGHT.

4d	1 3/8	373
5	1 3/4	272
6	2	196

BRADS.

6d	2	163
8	2 1/2	96
10	2 3/4	74
12	3 1/8	50

CLINCH.

Length Inches.	No. to Lb.
2	152
2 1/4	133
2 1/2	92
2 3/4	72
3	60
3 1/4	43

FENCE.

2	96
2 1/4	66
2 1/2	56
2 3/4	50
3	40

SPIKES.

3 1/2	19
4	15
4 1/2	13
5	10
5 1/2	9
6	7

BOAT.

1 1/2	206

FINISHING.

Size.	Length Inches.	No. to Lb.
4d	1 3/4	384
5	1 3/8	256
6	2	204
8	2 1/2	102
10	3	80
12	3 5/8	65
20	3 7/8	46

CORE.

6d	2	143
8	2 1/2	68
10	2 1/3	60
12	3 1/8	42
20	3 3/4	25
30	4 1/4	18
40	4 3/4	14
W H	2 1/2	69
W H L	2 1/4	72

SLATE.

3d	1 5/16	288
4	1 7/16	244
5	1 3/4	187
6	2	146

In the above table *d* stands for penny. This term penny, as applied to nails, is generally supposed to have been derived from pound. It originally meant so many pounds to the thousand; that is, six-penny means six pounds of nails to the thousand.

Tacks.

Size.	Length.	Number to Pound.	Size.	Length.	Number to Pound.	Size.	Length.	Number to Pound.
1 oz.	1/8	16000	4 oz.	7/16	4000	14 oz.	13/16	1143
1 1/2	3/16	10066	6	9/16	2666	16	7/8	1000
2	1/4	8000	8	5/8	2000	18	15/16	888
2 1/2	5/16	6400	10	11/16	1600	20	1	800
3	3/8	5333	12	3/4	1333	22	1 1/16	727

RAILROAD SPIKES.

Size Measured Under Head.	Average No. per keg of 200 lbs.	Ties two feet between centers, Four spikes per tie, Makes per Mile.	Rail used. Wt. per Yard.
5½x$\frac{9}{16}$	360	5870 lbs.—29⅓ kegs.	45 to 70
5 x$\frac{9}{16}$	400	5170 " —26 "	40 to 56
5 x½	450	4660 " —23⅓ "	35 to 40
4½x½	530	3960 " —20 "	28 to 35
4 x½	600	3520 " —17⅔ "	24 to 35
4½x$\frac{7}{16}$	680	3110 " —15½ "	20 to 30
4 x$\frac{7}{16}$	720	2940 " —14¾ "	
3½x$\frac{7}{16}$	900	2350 " —11¾ "	16 to 25
4 x⅜	1000	2090 " —10½ "	
3½x⅜	1190	1780 " — 9 "	16 to 20
3 x⅜	1240	1710 " — 8½ "	
2½x⅜	1342	1575 " — 7⅞ "	12 to 16

RAILS REQUIRED PER MILE

OF FOLLOWING WEIGHT PER YARD.

Weight per yard.	Tons of 2,240 lbs. per Mile.
16 lbs.	25 tons, 320 lbs.
20 "	31 " 960 "
25 "	39 " 640 "
28 "	44 " 0 "
30 "	47 " 320 "

Weight per yard.	Tons of 2,240 lbs. per Mile.
35 lbs.	55 tons, 0 lbs.
40 "	63 " 1920 "
45 "	70 " 1600 "
56 "	88 " 0 "
60 "	94 " 640 "
65 "	102 " 320 "
70 "	110 " 0 "

CROSS TIES, PER MILE.

Center to Center.	No. Ties.
1½ Feet	3520
1¾ "	3017
2 "	2640
2¼ "	2348
2½ "	2113

SPLICE JOINTS, PER MILE.

Two Bars and Four Bolts and Nuts to each Joint.

Rails,	20	feet long,	528 joints.
"	24	" "	440 "
"	26	" "	406 "
"	28	" "	378 "
"	30	" "	352 "

Nails Required for Different Kinds of Work.

For 1,000 shingles, 3½ to 5 lbs. 4*d*. nails, or 3 to 3½ lbs. 3*d*.

1,000 laths, about 7 lbs. 3*d*. fine.

1,000 feet clapboards, about 18 lbs. 6*d*. box.

1,000 feet covering boards, about 20 lbs. 8*d*. common, or 25 lbs. 10*d*.

1,000 feet upper floors, square edged, about 38 lbs. 10*d*. floor, or 41 lbs. 12*d*. floor.

1,000 feet upper floors, matched and blind-nailed, 38 lbs. 10*d*., or 42 lbs. 12*d*. common.

10 feet partitions, studs or studding, 1 lb. 10*d*. common.

1,000 feet furring, 1 x 3, about 45 lbs. 10*d*. common.

1,000 feet furring, 1 x 2, about 65 lbs. 10*d*. common.

1,000 feet pine finish, about 30 lbs. 8*d*. finish.

Brick Required to Construct Any Building.

(Reckoning 7 brick to each superficial foot.)

Superficial Feet of Wall.	Number of Bricks to Thickness of					
	4 in.	8 in.	12 in.	16 in.	20 in.	24 in.
1	7	15	23	30	38	45
2	15	30	45	60	75	90
3	23	45	68	90	113	135
4	30	60	90	120	150	180
5	38	75	113	150	188	225
6	45	90	135	180	225	270
7	53	105	158	210	263	315
8	60	120	180	240	300	360
9	68	135	203	270	338	405
10	75	150	225	300	375	450
20	150	300	450	600	750	900
30	225	450	675	900	1125	1350
40	300	600	900	1200	1500	1800
50	375	750	1125	1500	1875	2250
60	450	900	1350	1800	2250	2700
70	525	1050	1575	2100	2625	3150
80	600	1200	1800	2400	3000	3600
90	675	1350	2025	2700	3375	4050
100	750	1500	2250	3000	3750	4500
200	1500	3000	4500	6000	7500	9000
300	2250	4500	6750	9000	11250	13500
400	3000	6000	9000	12000	15000	18000
500	3750	7500	11250	15000	18750	22500
600	4500	9000	13500	18000	22500	27000
700	5250	10500	15750	21000	26250	31500
800	6000	12000	18000	24000	30000	36000
900	6750	13500	20250	27000	33750	40500
1000	7500	15000	22500	30000	37500	45000

Facts for Builders.

1,000 shingles, laid 4 inches to the weather, will cover 100 sq. ft. of surface, and 5 lbs. of shingle nails will fasten them on.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching.

1,000 laths will cover 70 yards of surface, and 7 lbs. of lath nails will nail them on. Eight bushels of good lime, 16 bushels of sand, and 1 bushel of hair will make enough good mortar to plaster 100 square yards.

A cord of stone, 3 bushels of lime, and a cubic yard of sand, will lay 100 cubic feet of wall.

Cement 1 bushel and sand 2 bushels will cover 3½ square yards 1 inch thick, 4½ square yards ¾ inch thick, 6¾ square yards ½ inch thick. 1 bu. cement and one of sand will cover 2¼ square yards 1 inch thick, 3 square yards ¾ inch thick, and 4½ square yards ½ inch thick.

Five courses of brick will lay 1 foot in height on a chimney. 8 bricks in a course will make a flue 4 ins. wide and 12 ins. long, and 16 bricks in a course will make a flue 8 ins wide and 16 ins. long.

Twenty-two cubic feet of stone, when built into the wall, is 1 perch.

Three pecks of lime and four bushels of sand are required to each perch of wall.

There are 20 common bricks to a cubic foot when laid; and 15 common bricks to a foot of 8-inch wall when laid.

Fifty feet of boards will build one rod of fence five boards high, first board being 10 inches wide, second 8 inches, third 7 inches, fourth 6 inches, fifth 5 inches.

Useful Facts for Bricklayers and Plasterers.

The average weight of smaller-sized bricks is about 4 lbs.; of the larger about 6 lbs.

Dry bricks will absorb about one-fifteenth of their weight in water.

A load of mortar measures a cubic yard, or 27 cubic ft.; requires a cubic yard of sand and 9 bus. of lime and will fill 30 hods.

A bricklayer's hod 1 ft. 4 in. by 9 in. by 9 in. equals 1,296 cubic in. in capacity, and contains 20 bricks.

A single load of sand and other materials equals a cubic yard, or 27 cubic ft.; a double load twice that quantity.

One thousand bricks, closely stacked, occupy about 56 cubic ft. One thousand old bricks, cleaned and loosely stacked, occupy about 72 cubic feet.

One superficial foot of gauged arches requires ten bricks.

One superficial foot of facings requires seven bricks.

One yard of paving requires 36 stock bricks laid flat, or 52 on edge, and 36 paving bricks laid flat, or 82 on edge.

The bricks of different makers vary in dimensions, and those of the same maker vary also, owing to varying degrees of heat in burning. The calculations given above are therefore approximate.

One hundred yards of plastering will require 1,400 laths, 4½ bus. lime, four-fifths of a load of sand, 9 lbs. hair, and 9 lbs. nails, for two-coat work.

Three men and one helper will put on 450 yards, in a day's work, of two-coat work, and will put on a hard finish for 300 yards.

A bushel of hair weighs, when dry, about 15 lbs.

PUTTY, FOR PLASTERING, is a very fine cement made of lime only. It is thus prepared: Dissolve in a small quantity of water, as two or three gallons, an equal quantity of fresh lime, constantly stirring it with a stick until the lime be entirely slacked, and the whole becomes of a suitable consistency, so that when the stick is taken out of it, it will but just drop therefrom; this, being sifted or run through a hair sieve, to take out the gross parts of the lime, is fit for use. Putty differs from fine stuff in the manner of preparing it, and its being used without hair.

ESTIMATES OF MATERIALS.

TO FIND THE NUMBER OF BRICKS REQUIRED IN A BUILDING.—Rule—Multiply the number of cubic feet by 22½. The number of cubic feet is found by multiplying the length, height and thickness (in feet) together. Bricks are usually made 8 inches long, 4 inches wide and 2 inches thick; hence it requires 27 bricks to make a cubic foot without mortar, but it is generally assumed that the mortar fills 1-6 of the space.

ESTIMATES OF MATERIALS.—3½ barrels of lime will do 100 square yards plastering, two coats.

2 barrels of lime will do 100 square yards plastering, one coat.

1½ bushels of hair will do 100 square yards plastering.

1¼ yards good sand will do 100 square yards plastering.

⅓ barrel of plaster (stucco) will hard-finish 100 square yards plastering.

1 barrel of lime will lay 1,000 bricks. (It takes good lime to do it.)

2 barrels of lime will lay 1 cord rubble stone.

½ barrel of lime will lay 1 perch rubble stone (estimating ¼ cord to perch).

To every barrel of lime estimate about ⅝ yards of good sand for plastering and brick work.

MASON WORK—BRICK.—1⅛ barrels lime and ⅝ yard sand will lay 1,000 brick.

One man with 1¼ tenders will lay 1,800 to 2,000 brick per day.

RUBBLE.—1¼ barrels lime and 1 yard of sand will lay 100 feet of stone.

One man will lay 150 feet of stone per day with one tender.

CEMENT.—1¼ barrels cement and ¾ yard sand will lay 100 feet rubble stone. Same time as to mason and tender as rubble.

FLOOR, WALL AND ROOF MEASURE.—To find the number of square yards in a floor or wall: Rule—Multiply the length by the width or height (in feet) and divide the product by 9; the result will be square yards.

BIG SALARIES.—There are a score of men in New York who are paid as much for their services each year as the President of the United States. Forty thousand dollars a year is a very tidy salary. There are hundreds of men who get $25,000 a year salary, and the number who get from $10,000 to $20,000 are legion. Very ordinary men get from $5,000 to $8,000 a year, or as much as a Cabinet officer. Dr. Norvin Green, president of the Western Union Telegraph Company, is paid $50,000. So is Chauncey M. Depew, president of the New York Central Railroad. Richard M. McCurdy, president of the Mutual Life Insurance Company, gets a like amount. John Hoey, president of Adams Express Company, fares equally as well. President Henry B. Hyde, of the Equitable Life Insurance Company, is also on the list. George G. Williams, president of the Chemical National Bank, the richest banking institution in America, with nearly $5,000,000 of surplus, $20,000,000 average deposits, is paid a salary of $25,000 yearly. President Potts of the Paris Bank and President Tappan of the Gallatin National Bank receive a like sum each twelve months. The best paid minister in New York is Dr. John Hall, a brainy man from the north of Ireland, who preaches to $20,000,000 every Sunday. His is the smallest church in town. He owes his rise in life to Robert Bonner of the *Ledger*, who found him preaching to a small delegation in Dublin, and induced him to come to America. He gets a salary of $20,000 a year and makes $5,000 by his newspaper and magazine articles. He is given a luxuriously furnished house as well. Dr. Morgan Dix, the chief pastor of Trinity Church corporation, the wealthiest in America, receives $15,000 yearly. Dr. William L. Taylor, of the Broadway Tabernacle, gets the same amount. He does literary work and lecturing that brings his income up to $20,000. Dr. Charles Hall, of the Fifth Avenue Presbyterian Church, is paid $15,000. He is very eloquent, and his church is crowded at all services. Dr. Parkhurst, of Madison Square Church, gets $12,000. He has a large and distinguished congregation. Cyrus W. Field is one of the pillars of the church. Dr. Paxton, who preaches to Jay Gould and others less wealthy, is paid $15,000. The Rev. Robert Collyer, the blacksmith preacher, is paid $10,000.

BUILDERS' ESTIMATING TABLES.

Quantity of material in every four lineal feet of exterior wall in a balloon frame building, height of wall being given:

Length of Studs.	Size of Sills.	Size of Studs, Braces, etc.	Quantity of Rough Lumber.	Quantity of Inch Boarding.	Siding in sup. feet.	Tar Paper in sup. feet.
8	6x 6	2x4 Studs	42	36	40	74
10	6x 8	4x4 Braces	52	44	50	80
12	6x10	4x4 Plates	62	53	60	96
14	6x10	1x6 Ribbons	69	62	70	112
16	8x10		82	71	80	128
18	8x10	Studs	87	80	90	144
20	8x12	16 inches from	98	88	100	160
22	9x12	centers	109	97	110	176
24	10x12		119	106	120	192
18	10x10	2x6 Studs	122	80	90	144
20	10x12	6x6 Braces	137	88	100	160
22	10x12	4x6 Plates	145	97	110	176
24	12x12	1x6 Ribbons	162	106	120	192
26	10x14		169	114	130	208
28	10x14	Studs 16 inch centers	176	123	140	224
30	12x14		198	132	150	240

Amount of lumber in rafters, collar-piece and boarding, and number of shingles to four lineal feet of roof, measured from eave to eave over ridge.

Rafters 16-inch centers:

Width of House, Feet.	Size of Rafters.	Size of Collar-piece.	Quantity of Lumber in Rafter and Collar-piece.	Quantity of Boarding, Feet.	No. of Shingles.
14	2x4	2x4	39	91	560
16	2x4	2x4	45	70	640
18	2x4	2x4	50	79	720
20	2x4	2x4	56	88	800
22	2x4	2x4	62	97	880
24	2x4	2x4	67	106	960
20	2x6	2x6	84	88	800
22	2x6	2x6	92	97	880
24	2x6	2x6	101	106	960
26	2x6	2x6	109	115	1040
28	2x6	2x6	117	124	1120
30	2x6	2x6	126	133	1200

COMPARATIVE STRENGTH OF TIMBER AND CAST IRON.

Table showing the transverse strength of timber and of cast iron one foot long and one inch square.

MATERIAL.	Breaking Weight, lbs.	Weight Borne with Safety, lbs.
Ash, seasoned	175	105
Chestnut, seasoned	170	115
Hickory, seasoned	270	200
White Oak, seasoned	240	196
White Pine, seasoned	135	95
Yellow Pine, seasoned	150	100
Iron (cast)	5,781	4,000

HOW TO USE CEMENT.

The following general rules referring to the practical use of cement will be found convenient for reference:

Quality of Sand—The sand should be clean, sharp and coarse. When the sand is mixed with loam the mortar will set comparatively slow, and the work will be comparatively weak. Fine sand, and especially water-worn sand, delays the setting of the cement, and deteriorates strength. Damp sand should not be mixed with dry cement, but the cement and sand should be mixed thoroughly and uniformly together, when both are dry, and no water should be applied until immediately before the mortar is wanted for use.

Proportion of Sand—The larger the proportion of cement the stronger the work. One part of good cement to two parts sand is allowable for ordinary work; but for cisterns, cellars, and work requiring special care, half and half is the better proportion. For floors, the cement should be increased toward the surface.

Water in Concrete—Use no more water in cement than absolutely necessary. Cement requires but a very small quantity of water in crystalizing. Merely dampening the material gives the best results. Any water in excess necessarily evaporates and leaves the hardened cement comparatively weak and porous.

Concrete in Water—Whenever concrete is used under water, care must be taken that the water is still. So say all English and American authorities. In laying cellar floors, or constructing cisterns or similar work, care must also be taken to avoid *pressure of exterior water*. Cement will not crystalize when disturbed by the force of currents, or pressure of water, but will resist currents and pressure after hardening only. In still water, good cement will harden quicker than in air, and when kept in water will be stronger than when kept in air. Cements which harden especially quick in air are usually slow or worthless in water.

How to Put Down Concrete—When strong work is wanted, for cellar floors and all similar work, the concrete should be dampened and tamped down to place, with the back of a spade, or better, with the end of a plank or rammer; then finished off with a trowel, thus leveling and compacting the work. Only persons ignorant of the business will lay a floor or walk with soft cement mortar. All artificial stone is made in a similar way to that described, and, when set, is strong and hard as stone.

Delay in Use—Do not permit the mortar to exhaust its setting properties by delaying its use when ready. Inferior cements only will remain standing in the mortar-bed any length of time without serious injury.

Stone and Brick Work—In buildings constructed of stone or brick, the best protection from dampness and decay, and also from the danger of cyclones, is a mortar of cement and coarse sand. The extra cost is inconsiderable, and the increased value of the structure very great. Chimneys laid in this manner never blow down, and cellars whose foundations are thus laid are always free from atmospheric moisture. Cement may also be mixed with lime mortar for plastering and other purposes, to great advantage.

Effect of Frost and Cold—At a temperature less than 60 degrees Fahrenheit, all good cement sets slowly, though surely, but if allowed to freeze its value is seriously impaired. In cold weather or cold water do not fear to wait for your concrete to crystalize.

Damage from Moisture—Good cement is not injured by age, if carefully preserved from moisture. Lumps in bags or barrels of cement are caused by exposure to moisture. They prove the originally good quality of the cement.

THE Ramphorhyncus, the remains of which have been found in the quarries of Solenhofen, Germany, was a curious intermediate link between birds and reptiles. Its tail, a singular appendage, was long, reptile-like, and dragged upon the ground, while its footprints were bird-like.

JOHN VERRAZANNI, an eminent Florentine navigator, in 1524, landed where the lower extremity of New York City is, and giving the natives some spirituous liquors made many of them drunk. The Indians called the place Manna-ha-ta, or "place of drunkenness," and they were afterwards called Manna-ha-tans.

USEFUL TABLES FOR PLUMBERS, ETC.

SIZES AND WEIGHTS OF LEAD PIPE.

CALIBRE.	Weight per foot.	
	LBS.	OZ.
3/32 inch Tubing		1¼
1/8 inch Tubing		3
3/16 inch Tubing		4
¼ inch Tubing		6
Fish Seine		15
⅜ inch Aqueduct		8
Ex. Light		9
Light		12
Medium	1	
Strong	1	8
Ex. Strong	2	
½ inch Aqueduct		10
Ex. Light		12
Light	1	
Medium	1	4
Strong	1	12
AA	2	
Ex. Strong	2	8
Ex. Ex. Strong	3	
⅝ inch Aqueduct		12
Ex. Light	1	4
Light	1	12
Medium	2	
Strong	2	8
Ex. Strong	3	
Ex. Ex. Strong	3	8
¾ inch Aqueduct	1	
Ex. Light	1	8
Light	2	
Medium	2	4
Strong	3	
Ex. Strong	3	8
Ex. Ex. Strong	4	
⅞ inch Aqueduct	1	8
Ex. Light	2	
Light	2	8
Medium	3	
Strong	3	8
1 inch Aqueduct	1	8
Ex. Light	2	
Light	2	8
Medium	3	4
Strong	4	
Ex. Strong	4	12
Ex. Ex. Strong	5	8
1¼ inch Aqueduct	2	
Ex. Light	2	8
Light	3	
Medium	3	12

CALIBRE.	Weight per foot.	
	LBS.	OZ.
1¼ inch Strong	4	12
Ex. Strong	6	
Ex. Ex. Strong	6	12
1½ inch Aqueduct	3	
Ex. Light	3	8
Light	4	
Medium	5	
Strong	6	
Ex. Strong	7	8
Ex. Ex. Strong	9	
1¾ inch Ex. Light	3	12
Light	4	8
Medium	5	8
Strong	6	8
Ex. Strong	8	
2 inch Waste	3	
Ex. Light	4	
Light	5	
Medium	7	
Strong	8	
Ex. Strong	9	
Ex. Ex. Strong	10	8
2½ inch Waste	4	
Light	6	
3/16 thick	8	
¼ thick	11	
5/16 thick	14	
⅜ thick	17	
3 inch Waste	3	
Waste	3	12
Light	5	
3/16 thick	9	
¼ thick	12	
5/16 thick	16	
⅜ thick	20	
3½ inch Waste	5	
¼ thick	15	
5/16 thick	18	
4 inch Waste	5	
Waste	6	
Waste	8	
Waste	10	
¼ thick	16	
5/16 thick	21	
⅜ thick	25	
4½ inch Waste	6	
5 inch Waste	8	
6 inch Waste	10	

SEEST thou a man diligent in his business? He shall stand before kings; he shall not stand before mean men.—OLD TESTAMENT.

SIZES AND WEIGHTS OF PURE BLOCK TIN PIPE.

3-16	in.	4	oz.		¾	in.	7	oz. and 12 oz.
¼	"	4	oz. and	6 oz.	1	"	12	" " 16 "
5-16	"	5	" "	8 "	1¼	"	1¼	lb. and 1¾ lb.
⅜	"	4	" "	6 "	1½	"	1½	" " 2 "
½	"	6	" "	8 "	2	"	2	" " 3 "
⅝	"	9	" "	12 "				

WEIGHT PER SQUARE FOOT OF SHEET LEAD.

1-32	in.	thick	2	lbs.	1-10	in.	thick	7 lbs.
3-64	"	"	2½	"	⅛	"	"	8 "
1-25	"	"	3	"	5-32	"	"	10 "
1-16	"	"	4	"	3-16	"	"	12 "
1-14	"	"	5	"	7-32	"	"	14 "
1-12	"	"	6	"	¼	"	"	16 "

WEIGHT PER JOINT OF LEAD AND GASKET FOR STREET MAINS.

	Lead.	Gasket.		Lead.	Gasket.
2-inch Pipe,	3.25 lbs.,	0.050 lbs.	10-inch Pipe,	15 lbs.,	0.30 lbs.
3-inch "	4.72 "	0.075 "	12-inch "	20 "	0.35 "
4-inch "	6. "	0.115 "	16-inch "	25 "	0.45 "
6-inch "	9. "	0.175 "	18-inch "	29 "	0.52 "
8-inch "	12. "	0.250 "	20-inch "	43 "	0.60 "

CAPACITY OF DRAIN-PIPE.

Size of Pipe.	Gallons Per Minute.							
	½ in. Fall per 100 feet.	3-in. Fall per 100 feet.	6-in. Fall per 100 feet.	9-in. Fall per 100 feet.	12-in. Fall per 100 feet.	18-in. Fall per 100 feet.	24-in. Fall per 100 feet.	36-in. Fall per 100 feet.
3-inch.	21	30	42	52	60	74	85	104
4 "	36	52	76	92	108	132	148	184
6 "	84	120	169	206	240	294	338	414
9 "	232	330	470	570	660	810	930	1140
12 "	470	680	960	1160	1360	1670	1920	2350
15 "	830	1180	1680	2040	2370	2920	3340	4100
18 "	1300	1850	2630	3200	3740	4600	5270	6470
20 "	1760	2450	3450	4180	4860	5980	6850	8410

The maximum rainfall is about one inch per hour (except during very heavy storms)—equal to 22,633 gallons an hour for each acre, or 377 gallons a minute per acre.

Avoid shame, but do not seek glory—nothing so expensive as glory.—Sidney Smith.

That this nation, under God, shall have a new birth of freedom, and that government of the people, by the people, for the people, shall not perish from the earth.—Abraham Lincoln.

HINTS FOR ROOFERS.

The average width of a shingle is four inches. Hence, when shingles are laid four in. to the weather each shingle averages 16 sq. in., and 900 are required for a square of roofing (100 sq. ft). If 4½ in. to the weather, 800; 5 in., 720; 5½ in., 655; 6 in., 600. In hip-roofs, where the shingles are cut more or less to fit the roof, 5% should be added to these figures.

One thousand shingles laid four inches to the weather will require five pounds of shingle nails. Six pounds of 4*d* nails will lay 1000 split pine shingles.

A carpenter will carry up and lay on the roof from 1,500 to 2,000 shingles per day, or two squares to two squares and a half of plain gable-roofing.

The pitch of a slated roof should be about one in height to four in length. The usual lap is about 3 in., sometimes 4 in. Each slate should be fastened by two 3*d* slate nails, either of galvanized iron, copper or zinc. On roofs of gas-houses the nails should be of copper or yellow metal.

The sides and bottom edges of roof slates should be trimmed, and the nail-holes punched as near the head as possible. When slates are not of uniform size they should be sorted, and the smallest placed near the ridge.

In a first-class slate roof the top course on ridge, and the slate from two to four feet from gutters, and one foot each way from valleys and hips, should be bedded in elastic cement.

Roof-boards for slate roofs should be covered with one or two thicknesses of tarred felt roofing paper before slates are laid. Dry or rosin-sized felt should not be used on roofs.

Number of Slates per Square.

Size in Inches.	Slates per Square.	Size in Inches.	Slates per Square.	Size in Inches.	Slates per Square.
6 x 12	533	8 x 16	277	12 x 20	141
7 x 12	457	9 x 16	246	14 x 20	121
8 x 12	400	10 x 16	221	11 x 22	137
9 x 12	355	9 x 18	213	12 x 22	126
7 x 14	374	10 x 18	192	14 x 22	108
8 x 14	327	12 x 18	160	12 x 24	114
9 x 14	291	10 x 20	169	14 x 24	98
10 x 14	261	11 x 20	154	16 x 24	86

Number of Shingles Required in a Roof.

To the square foot, it takes 9 if exposed 4 inches; 8 if exposed 4½ inches, and 7 1-5 if exposed 5 inches to the weather.

Find the number of shingles required to cover a roof 38 ft. long and the rafters on each side 14 ft. Shingles exposed 4½ inches.

$28 \times 38 = 1064$ (sq. ft.) $\times 8 = 8512$ shingles. Ans.

To find the length of rafters, giving the roof one-third pitch, take three-fifths of the width of the building. If the building is 30 feet wide, they must be 18 feet long, exclusive of projection.

A tin roof, properly put on, and kept painted, will last thirty

years. It ought not to be painted for the first time until it has been on about thirty days, so as to get the grease off the tin, and all the rosin should be carefully scraped off.

It is sometimes necessary, on buildings where there is much dampness or steam, as stables, blacksmith shops, round-houses, etc., to paint the roof tin one coat on the under side before laying.

Tin roofs should be laid with cleats, and not by driving the nails through the tin itself.

There are two kinds of tin—"bright tin," the coating of which is all tin, that is, the tin proper; and "tern," "leaded," or "roofing" tin, the coating of which is a composition, part tin and part lead. This last is a little cheaper, and will not rust any quicker, but the sulphur in soft coal smoke eats through the "leaded" coating sooner than through the "tinned."

There are two sizes of tin, 10x14 and 14x20, and two grades of thickness—IC light, and IX, heavy. For a steep roof (one-sixth pitch or over) the IC 14x20 tin ("leaded" if high up where little smoke will get to it; "bright" if low down), put on with a standing groove, and with the cross-beams put together with a double lock, makes as good a roof as can be made. For flat roofs IX 10x14 "light" is best, laid with cleats, but the others make good roofs, and any of them will last 25 years at least.

NUMBER OF SQUARE FEET A BOX OF ROOFING TIN WILL COVER.—For flat seam roofing, using ½-inch locks, a box of "14x20" size will cover about 192 square feet, and for standing seam, using ⅜-inch locks and turning 1¼ and 1½ inches edges, making 1-inch standing seams, it will lay about 168 square feet.

For flat seam roofing, using ½-inch locks, a box of "28x20" size will cover about 399 square feet, and for standing seam, using ⅜-inch locks and turning 1¼ and 1½ inches edges, making 1-inch standing seams, it will lay about 365 square feet.

Every box of roofing plates (IC or IX "14x20" or "28x20" sizes) contains 112 sheets.

Facts About Gas.

A cubic foot of good gas, from a jet one thirty-third of an inch in diameter and a flame of four inches, will burn 65 minutes.

Internal lights require four cubic feet, and external lights about five cubic feet, per hour. Large or Argand burners will require from six to ten feet.

In distilling 56 pounds of coal, the volume of gas produced in cubic feet, when the distillation was effected in three hours, was 41.3; in seven hours, 37.5; in twenty hours, 33.5; in twenty-five hours, 31.7.

A retort produces about 600 cubic feet of gas in five hours, with a charge of about one and a half cwt. of coal, or 2,800 cubic feet in twenty-four hours.

PAINTING AND GLAZING.

Painters' work is generally estimated by the square yard, and the cost depends on the number of coats applied, quality of work and material to be painted.

One coat, or *priming*, will take, per 100 yards of painting, 20 pounds of lead and 4 gallons of oil. Two-coat work, 40 pounds of lead and 4 gallons of oil. Three-coat, the same quantity as two-coat; so that a fair estimate for 100 yards of three-coat work would be 100 pounds of lead and 16 gallons of oil.

One gallon priming color will cover 50 superficial yards; white zinc, 50 yds.; white paint, 44 yds.; lead color, 50 yds.; black paint, 50 yds.; stone color, 44 yds.; yellow paint, 44 yds.; blue color, 45 yds.; green paint, 45 yds.; bright emerald green, 25 yds.; bronze green, 75 yds.

One pound of paint will cover about 4 superficial yards the first coat, and about 6 each additional coat. One pound of putty, for stopping, every 20 yards. One gallon of tar and 1 lb. of pitch will cover 12 yards superficial the first coat, and 17 yards each additional coat. A square yard of new brick wall requires, for the first coat of paint in oil, ¾ lb.; for the second, 3 lbs.; for the third, 4 lbs.

A day's work on the outside of a building is 100 yards of first coat, and 80 yds. of either second or third coat. An ordinary door, including casings, will, on both sides, make 8 to 10 yds. of painting, or about 5 yds. to a door without the casings. An ordinary window makes about 2½ or 3 yds.

WINDOW GLASS is sold by the box, which contains, as nearly as possible, 50 sq. ft., whatever the size of the panes. The thickness of ordinary, or "single thick" window glass is about one-sixteenth of an inch, and of "double thick" nearly ⅛ in. The tensile strength of common glass varies from 2,000 to 3,000 lbs. per sq. in., and its crushing strength from 6,000 to 10,000 lbs.

Where SKYLIGHTS are glazed with clear or double thick glass, it may be used in lengths of from 16 to 30 in. by a width of from 9 to 15 in. A lap of at least an inch and a half is necessary for all joints. This is the cheapest mode of glazing. The best, however, for skylight purposes is fluted or rough plate glass. The following thicknesses are recommended as proportionate to sizes: 12x48, 3-16 in.; 15x60, ¼ in.; 20x100, ⅜ in.; 94x156, ½ in.

POLISHED FRENCH PLATE WINDOW GLASS, which is the highest grade of window glass in the market, may be obtained in lights ranging in size from one inch square upwards. Owing to the extra cost of rolling large lights the price of these per square foot is sometimes double that of smaller lights.

FAITH is the substance of things hoped for, the evidence of things unseen.—NEW TESTAMENT.

PANES OF WINDOW GLASS IN A BOX OF 50 FEET.

Size, in inches.	Panes in box.	Size, in inches.	Panes in box.	Size, in inches.	Panes in box.	Size, in inches.	Panes in box.
6 x 8	150	12 x 19	32	16 x 20	23	24 x 44	7
7 x 9	115	12 x 20	30	16 x 22	20	24 x 50	6
8 x 10	90	12 x 21	29	16 x 24	19	24 x 56	5
8 x 11	82	12 x 22	27	16 x 30	15	26 x 36	8
8 x 12	75	12 x 23	26	16 x 36	12	26 x 40	7
9 x 10	80	12 x 24	25	16 x 40	11	26 x 48	6
9 x 11	72	13 x 14	40	18 x 20	20	26 x 54	5
9 x 12	67	13 x 15	37	18 x 22	18	28 x 34	8
9 x 13	62	13 x 16	35	18 x 24	17	28 x 40	6
9 x 14	57	13 x 17	33	18 x 26	15	28 x 46	6
9 x 15	53	13 x 18	31	18 x 34	12	28 x 50	5
9 x 16	50	13 x 19	29	18 x 36	11	30 x 40	6
10 x 10	72	13 x 20	28	18 x 40	10	30 x 44	4
10 x 12	60	13 x 21	26	18 x 44	9	30 x 48	5
10 x 13	55	13 x 22	25	20 x 22	16	30 x 54	5
10 x 14	52	13 x 24	23	20 x 24	15	32 x 42	5
10 x 15	48	14 x 15	34	20 x 25	14	32 x 44	5
10 x 16	45	14 x 16	32	20 x 26	14	32 x 46	5
10 x 17	42	14 x 18	29	20 x 28	13	32 x 48	5
10 x 18	40	14 x 19	27	20 x 30	12	32 x 50	4
11 x 11	59	14 x 20	26	20 x 34	11	32 x 54	4
11 x 12	55	14 x 22	23	20 x 36	10	32 x 56	4
11 x 13	50	14 x 24	22	20 x 40	9	32 x 60	4
11 x 14	47	14 x 28	19	20 x 44	8	34 x 40	5
11 x 15	44	14 x 32	16	20 x 50	7	34 x 44	5
11 x 16	41	14 x 36	14	22 x 24	14	34 x 46	5
11 x 17	39	14 x 40	13	22 x 26	13	34 x 50	4
11 x 18	36	15 x 16	30	22 x 28	12	34 x 52	4
12 x 12	50	15 x 18	27	22 x 36	9	34 x 56	4
12 x 13	46	15 x 20	24	22 x 40	8	36 x 44	5
12 x 14	43	15 x 22	22	22 x 50	7	36 x 50	4
12 x 15	40	15 x 24	20	24 x 28	11	36 x 56	4
12 x 16	38	15 x 30	16	24 x 30	10	36 x 60	3
12 x 17	35	15 x 32	15	24 x 32	10	36 x 64	3
12 x 18	33	16 x 18	25	24 x 36	9	40 x 60	3

CARPENTERS' WORK AND MEASURING.

What is called *Naked Flooring* in carpentry are the joists which support the flooring boards and ceiling of a room. There are different kinds, but they may all be comprised in the three following—viz.: single joisted floors, double floors, and framed floors.

A single joisted floor consists of only one series of joists; sometimes every third or fourth joist is made deeper, with ceiling joists nailed across at right angles. This is a good method, as ceilings stand better than when the laths are nailed to the joists alone.

A double floor consists of binding, bridging, and ceiling joists; the binding joists are the chief support of the floor, and the bridging joists are nailed upon the upper side of them; the ceiling joists are either notched to the under side or framed between

with chased mortises. The best method is to notch them.

Framed floors differ from double floors only in having the binding joists framed into large pieces of timber called *girders*.

Single joisted floors, when the bearing exceeds ten feet, should be cross-bridged between the joists to prevent them from turning or twisting sideways, and also to stiffen the floor; when the bearing exceeds fifteen feet, two rows will be necessary, and so on, adding another row for each five feet bearing.

Single joisting may be used to any extent for which timber can be got deep enough; but where it is desirable to have a perfect ceiling, the bearing should not exceed 18 ft., nor the distance from center to center be more than 16 inches; otherwise the bearing for the laths become too long to produce good work.

To find the depth of a joist, the length of bearing and the thickness being given—

RULE.—Divide the square of the length in feet by the thickness in inches, and the cube root of the quotient, multiplied by 2.2 for pine, or 2.3 for oak, will be the depth in inches.

Example.—Suppose a joist whose bearing is 10 feet, and the thickness two inches, what will be the depth?

Here $10\times10=100$, divided by 2, the thickness$=50$, the cube root of which is $3{,}684\times2.2=8.1048=$equals 8 inches, the depth.

To find the scantlings of joists for different bearings from 5 to 20 feet, at several thicknesses, refer to the table on following page.

Girders are the chief support of a framed floor, and their depth is often limited by the size of the timber; therefore the method of finding the scantling may be divided in two cases—

CASE 1.—To find the depth of a girder when the length of bearing and thickness of girder are given.

Rule.—Divide the square of the length in feet by the thickness in inches, and the cube root of the quotient, multiplied by 4.2 for pine, or 4.34 for oak, will give the depth required in inches.

CASE 2.—To find the thickness when the length of bearing and depth are given.

Rule.—Divide the square of the length in feet by the cube of the depth in inches, and the quotient multiplied by 74 for pine, or by 82 for oak, will give the thickness in inches.

In these rules the girders are supposed to be ten feet apart, and this distance should never be exceeded, but should the distance apart be more or less than 10 feet, the thickness should be made proportionate thereto.

Length of bearing in Feet	Thickness 2 inches.	Thickness 2½ inches.	Thickness 3 inches.	Thickness 3½ inches.	Thickness 4 inches.
	Depth in inches.	Depth in inches.	Depth in inches.	Depth in inches.	Depth in inches.
5	5¼	4¾	4⅜	4⅛	4
6	5¾	5⅜	5	4¾	4½
7	6½	6	5½	5¼	5
8	7	6½	6¼	5⅞	5¾
9	7½	6⅞	6½	6	5⅞
10	8	7½	7	6¾	6½
11	8¾	8	7½	7	6¾
12	9½	8½	8	7½	7¼
13	9¾	9	8½	8	7¾
14	10	9½	9	8½	8
15	10½	9¾	9¼	8¾	8½
16	11	10½	9¾	9¼	8⅞
17	11½	10¾	10¼	9¾	9¼
18	12	11¼	10½	10	9½
19	12½	11½	10¾	10¼	10
20	13	12	11¼	10¾	10¼

When the breadth of girders is considerable it is an excellent method to saw them down the middle and bolt them together, with the sawn sides outward.

Partitions unsupported from underneath the floors should be supported from the walls by means of a simple truss. This can be made by setting two pieces of scantling into the walls on either side at the floor to abut against each other at the ceiling or against a collar-beam over the doors. This plan will obviate the sinking of floors so often seen under partitions.

Weight of Lumber, Etc., Dry.

FLOORING—Dressed and matched, per 1,000 ft	1,800 lbs.
SIDING—Dressed per 1,000 ft	800 "
CEILING—⅜ inch thick, per 1,000 ft	800 "
" ½ " " " "	900 "
BOARDS—Dressed one side, per 1,000 ft	2,100 "
" and dimensions, rough, per 1,000 ft	2,500 "
SHINGLES—per 1,000	250 "
LATH—per 1,000 pieces	500 "
PICKETS—Dressed, per 1,000 pieces	1,800 "
" Rough, per 1,000 pieces	2,500 "

WEAR AND TEAR OF BUILDING MATERIALS.

The figures given below are averages deduced from replies made by eighty-three competent builders in twenty-seven cities and towns of Western States:

Material in Buildings.	Frame Dwellings.		Brick Dwellings. (Shingle roof)		Frame Stores.		Brick Stores. (Shingle roof)	
	Average Life, years.	Percentage of Depreciation per Annum.	Average Life, years.	Percentage of Depreciation per Annum.	Average Life, years.	Percentage of Depreciation per Annum.	Average Life, years.	Percentage of Depreciation per Annum.
Brick	..	..	75	1⅓	..	..	66	1½
Plastering	20	5	30	3⅓	16	6	30	3⅓
Painting, outside	5	20	7	14	5	20	6	16
Painting, inside	7	14	7	14	5	20	6	16
Shingles	16	6	16	6	16	6	16	6
Cornice	40	2½	40	2½	30	3⅓	40	2½
Weather-boarding	30	3⅓	..	..	30	3⅓	..	..
Sheathing	50	2	50	2	40	2½	50	2
Flooring	20	5	20	5	13	8	13	8
Doors, complete	30	3⅓	30	3⅓	25	4	30	3⅓
Windows, complete	30	3⅓	30	3⅓	25	4	30	3⅓
Stairs and newel	30	3⅓	30	3⅓	20	5	20	5
Base	40	2½	40	2½	30	3⅓	30	3⅓
Inside blinds	30	3⅓	30	3⅓	30	3⅓	30	3⅓
Building hardware	20	5	20	5	13	8	13	8
Piazzas and porches	20	5	20	5	20	5	20	5
Outside blinds	16	6	16	6	16	6	16	6
Sills and first floor joints	25	4	40	2½	25	4	30	3⅓
Dimension lumber	50	2	75	1⅓	40	2½	66	1½

In Java the "Valley of the Upas Tree" is sometimes called the "Valley of Death," and its deadly influence was formerly ascribed to the malignant properties of a peculiar vegetable production of the island, called the "upas tree," which especially flourishes in this locality. Recent travelers, however, declare that accounts of the fatality attending a passage of this famous valley have been greatly exaggerated.

A man may fish with the worm that hath eat of a king, and eat of the fish that hath fed of that worm.—*Shakespeare.*

Sizes of Chairs and Desks for Schools.

Desks for Single Scholar, 2 ft. long; For Two Scholars, 3 ft. 10 in.

Age of Scholar.	Height of Chair.	Height of Desk (next scholar).	Space Occupied by Desk and Chair.
16 to 18 years.	16¾ inches.	29½ inches.	2 feet 9 inches.
14 to 16 "	15½ "	28 "	2 " 9 "
12 to 14 "	15½ "	27½ "	2 " 8 "
10 to 12 "	14¼ "	26½ "	2 " 7 "
8 to 10 "	13¼ "	25½ "	2 " 5 "
7 to 8 "	12¼ "	24 "	2 " 4 "
6 to 7 "	11½ "	22½ "	2 " 3 "
5 to 6 "	10½ "	21 "	2 " 2 "
4 to 5 "	9½ "	19 "	2 " 0 "

WEIGHT OF FLOORS, AND THE LOAD UPON SAME.

The dead weight of a fire-proof floor will average for the arches, concrete, plastering and flooring, 70 lbs. per sq. foot. The live weight, equal to a dense crowd of people, 80 lbs. per sq. foot, or a total for an office building of 150 lbs. per sq. foot.

The following loads are exclusive of weight of arches and beams:

Dense crowd of people	80	lbs.	per	sq.	foot
For floors of houses	50	"	"	"	"
Theaters and churches	80	"	"	"	"
Ball rooms	90	"	"	"	"
Ware houses	250	"	"	"	"
Factories	200 to 450	"	"	"	"
Snow 30 inches deep	15	"	"	"	"
Brick walls	112	"	"	cubic	"
Stone (Chicago lime stone, dressed)	160	"	"	"	"

The dead weight of a wooden floor, including wood joists:

Double flooring and plastering will average	25	lbs.	per	sq.	foot
If deafened	35	"	"	"	"
Stud partition of wood plastered each side	20	"	"	"	"

In estimating the weight of a flat ceiling and roof it will be safe to assume the following:

Ceiling of wooden construction	15	lbs	per	sq.	foot.
Ceiling of iron construction	25 to 65	"	"	"	"
Roof of wooden construction	45	"	"	"	"
Roof of iron construction	65 to 100	"	"	"	"

The weight of roof includes the wind pressure and snow.

STRENGTH OF PIERS.—Granite will sustain 40 tons per sq. ft.; Berea (sand stone), 30 tons per sq. ft.; limestone (magnesium), 29 tons per sq. ft.; Portland (sand stone), 13 tons per sq. ft.; brick in cement, 3 tons per sq. ft.; rubble masonry, 2 tons per sq. ft.; lime, cement foundation, 2½ tons per sq. ft.

WEIGHT OF VARIOUS MATERIALS.

WEIGHT OF STONES.—Granite, (averages) per cubic foot, 170 lbs.; limestone (magnesium), 144 lbs.; Berea (sand stone), 140 lbs.; free stone, 140 lbs.; gypsum, natural state, 140 lbs.

One ton of vein marble is 13 cubic feet; of statuary marble, 13½; granite, 13½; of Berea stone, 14⅓; of limestone, magnesium, 13¾.

WEIGHT OF MASONRY.—Granite, per cubic foot, 160 lbs.; of Berea stone range, 140; of limestone rubble, 140; of brick, dry, 115; of brick, dry (press), 130; of brick, dry (fire), 150; of brick masonry in mortar, 110; of brick masonry cement, 112.

WEIGHT OF MARBLE SLABS.—One-half inch thick, per sq. foot, 7.17 lbs.; ¾ inch thick, 10.75; 1 inch thick, 14.32; 1¼ inch thick, 17.92; 1½ inch thick, 21.05; 1¾ inch thick, 25.08; 2 inch thick, 28.67; 2½ inch thick, 35.83.

CEMENT AND LIME.—One bushel of Portland cement weighs 96 lbs.; of Rosendale, 70; of Louisville, 62; of quick lime well shaken, 80; of quick lime, loose, 70.

IRON AND WOOD.—One cubic foot of wrought iron weighs 480 lbs.; of cast iron, 450; of oak (seasoned), 48; of pine (seasoned), 36.

COAL.—One bushel of Anthracite weighs 86 lbs.; of Bituminous, 80; of coke (Connellsville), 40; of charcoal (hardwood) 30.

MISCELLANEOUS WEIGHTS.—Per cubic foot: Ordinary quick lime, 53 lbs.; old mortar, 90; new mortar, well tempered, 115; new mortar, 110; river sand (average), 107; river sand (screened), 95; clay with gravel, 130; earth—vegetable, 90; earth—loamy, 100; earth—semi fluid, 110.

SAN MARINO, in Italy, on the coast of the Adriatic Sea, is the oldest Republic in the world. It is, next to Monaco, the smallest State in Europe. The exact date of the establishment of this Republic is not known, but according to tradition, it was in the fourth century, by Marinus, a Dalmatian hermit, and has ever since remained independent. It is mountainous, and contains four or five villages. The word "LIBERTY" is inscribed on its capitol.

IS LIFE so dear, or peace so sweet, as to be purchased at the price of chains and slavery? Forbid it, Almighty God! I know not what course others may take; but as for me, give me liberty or give me death!—*Patrick Henry.*

THE law is a sort of hocus-pocus science, that smiles in yer face while it picks yer pocket; and the glorious uncertainty of it is of mair use to the professors than the justice of it.—*Macklin.*

KNOWLEDGE is of two kinds: we know a subject ourselves or we know where we can find information upon it.—*Johnson.*

Crushing and Tensile Strength, in Lbs., per Sq. Inch of Natural and Artificial Stones.

DESCRIPTION.	Weight per Cubic ft. in lbs.	Crushing Force. Lbs. per Square Inch.
Aberdeen Blue Granite	164	8,400 to 10,914
Quincy Granite	166	15,300
Freestone, Belleville	.....	3,522
Freestone, Caen	.....	1,088
Freestone, Connecticut	.....	3,319
Sandstone, Acquia Creek, used for Capitol, Washington	.....	5,340
Limestone, Magnesian, Grafton, Ill	.....	17,000
Marble, Hastings, N. Y	.....	18,941
Marble, Italian	.....	12,624
Marble, Stockbridge, City Hall, N. Y	.....	10,382
Marble, Statuary	.....	3,216
Marble, Veined	165	9,681
Slate	.....	9,300
Brick, Red	135.5	808
Brick, Pale Red	130.3	562
Brick, Common	.....	800 to 4,000
Brick, Machine Pressed	.....	6,222 to 14,216
Brick, Stock	.....	2,177
Brick-work, set in Cement, bricks not very hard	.....	521
Brick, Masonry, Common	.....	500 to 800
Cement, Portland	.....	1,000 to 8,300
Cement, Portland, Cement 1, Sand 1	.....	1,280
Cement, Roman	.....	342
Mortar	.....	120 to 240
Crown Glass	.....	31,000
		TENSION.
Portland Cement	.....	427 to 711
Portland Cement, with Sand	.....	92 to 284
Glass, Plate	.....	9,420
Mortar	.....	50
Plaster of Paris	.....	72
Slate	.	11,000

ERROR of opinion may be tolerated where reason is left free to combat it.—*Thomas Jefferson.*

VIRTUE is like precious odors, most fragrant when they are incensed or crushed.—*Lord Bacon.*

WEIGHT OF CAST IRON COLUMNS.

PER LINEAL FOOT OF PLAIN SHAFT.

Diam.	THICKNESS OF METAL.											
	¼ in.	⅜ in.	½ in.	⅝ in.	¾ in.	⅞ in.	1 in.	1⅛ in.	1¼ in.	1½ in.	1¾ in.	2 in.
2	4.3	6.0	7.4	8.4	9.2	9.7	9.8	.....	.....	.....	.....	.....
2½	5.5	7.8	9.8	11.5	12.9	14.0	14.7	.....	.....	.....	.....	.....
3	6.8	9.7	12.3	14.6	16.6	18.3	19.6	.....	.....	.....	.....	.....
3½	8.0	11.5	14.7	17.6	20.3	22.6	24.6	.....	.....	.....	.....	.....
4	9.2	13.3	17.2	20.7	23.9	26.8	29.5	.....	.....	.....	.....	.....
4½	10.4	15.2	19.6	23.8	27.6	31.1	34.4	37.3	39.9	.....	.....	.....
5	11.7	17.0	22.1	26.9	31.3	35.4	39.3	42.8	46.0	.....	.....	.....
5½	12.9	18.9	24.5	29.9	35.0	39.7	44.2	48.3	52.2	.....	.....	.....
6	14.1	20.7	27.8	33.0	38.7	44.0	49.1	53.9	58.3	.....	.....	.....
6½	15.3	22.6	29.5	36.1	42.3	48.3	54.0	59.4	64.4	.....	.....	.....
7	16.6	24.4	31.9	39.1	46.0	52.6	58.9	64.9	70.6	81.0	.....	.....
7½	17.8	26.2	34.4	42.2	49.7	56.9	63.8	70.4	76.7	88.4	.....	.....
8	19.0	28.1	36.8	45.3	53.4	61.2	68.7	75.9	82.8	95.7	.....	.....
8½	20.2	29.9	39.3	48.3	57.1	65.5	73.6	81.5	89.0	103.1	.....	.....
9	21.5	31.8	41.7	51.4	60.8	69.8	78.5	87.0	95.1	110.5	.....	.....
9½	22.7	33.6	44.2	54.5	64.4	74.1	83.5	92.5	101.2	117.8	133.2	.....
10	23.9	35.4	46.6	57.5	68.1	78.4	88.4	98.0	107.4	125.2	141.7	157.1
10½	25.2	37.3	49.1	60.6	71.8	82.7	93.3	103.5	113.5	132.5	150.3	166.9
11	26.4	39.1	51.6	63.7	75.5	87.0	98.2	109.1	119.7	139.9	158.9	176.7
11½	27.6	41.0	54.8	66.7	79.2	91.3	103.1	114.6	125.8	147.3	167.5	186.5
12	28.8	42.8	56.5	69.8	82.8	95.6	108.0	120.1	131.9	154.6	176.1	196.3
12½	.....	44.6	58.9	72.9	86.5	99.9	112.9	125.6	138.1	162.0	184.7	206.2
13	.....	46.5	61.4	75.9	90.2	104.2	117.8	131.2	144.2	169.4	193.3	216.0
13½	.....	.....	63.8	79.0	93.9	108.5	122.7	136.7	150.3	176.7	201.9	225.8
14	.....	.....	66.3	82.1	97.6	112.8	127.6	142.2	156.5	184.1	210.5	235.6
14½	.....	.....	68.7	85.2	101.2	117.0	132.5	147.7	162.6	191.4	219.1	245.4
15	.....	.....	71.2	88.2	104.9	121.3	137.5	153.2	168.7	198.8	227.6	255.2
16	.....	.....	76.1	94.3	112.3	129.9	147.3	164.3	181.0	213.5	244.8	274.9
17	.....	.....	81.0	100.5	119.7	138.5	157.1	175.3	193.3	228.3	262.0	294.5
18	.....	.....	85.9	106.6	127.0	147.1	166.9	186.4	205.6	243.0	279.2	314.1
19	.....	.....	90.8	112.8	134.4	155.7	176.7	197.4	217.8	257.7	296.4	333.8
20	.....	.....	95.7	118.9	141.7	164.3	186.5	208.5	230.1	274.4	313.5	353.4

INCREASE IN WEIGHT FOR 1-2 IN. INCREASE IN DIAMETER.

¼ in.	⅜ in.	½ in.	⅝ in.	¾ in.	⅞ in.	1 in.	1⅛ in.	1¼ in.	1½ in.	1¾ in.	2 in.
1.2	1.8	2.5	3.1	3.7	4.3	4.9	5.5	6.1	7.4	8.6	9.8

WEIGHT OF CAST IRON BALLS.

Diameter, Inches.	Weight, Lbs.	Diameter, Inches.	Weight, Lbs.	Diameter, Inches.	Weight, Lbs.
2	1.09	5	17.04	8	69.81
2½	2.13	5½	22.68	8½	83.73
3	3.68	6	29.45	9	99.40
3½	5.84	6½	37.44	10	136.35
4	8.73	7	46.76	11	181.48
4½	12.42	7½	57.52	12	235.65

To Find the Weight of Cast Iron Balls When the Diameter is Given—*Rule:* Multiply the cube of the diameter by .1377.

To Find the Diameter of Cast Iron Balls When the Weight is Given—*Rule:* Multiply the cube root of the weight by 1.936.

To Find the Weight of a Spherical Shell—From the weight of a ball of the outer diameter subtract the weight of one of the inner diameter.

Cast Iron—Assumed Weight in Estimating

A cubic foot . . . . . = 450 lbs.
A square foot, 1 inch thick . . . . . = 38 "
A bar 1 inch square and 1 foot long . . = 3.125 "

TABLE OF WEIGHT PER LINEAL FOOT OF ROUND CAST IRON.

Diameter, Inches.	Weight, Lbs.	Diameter, Inches.	Weight, Lbs.	Diameter, Inches.	Weight, Lbs.
1	2.45	5	61.36	9	198.80
1¼	3.84	5¼	67.65	9½	221.51
1½	5.52	5½	74.25	10	245.44
1¾	7.52	5¾	81.15	10½	270.60
2	9.82	6	88.36	11	296 98
2¼	12.43	6¼	95.87	11½	324.59
2½	15.34	6½	103.70	12	353.43
2¾	18.56	6¾	111.83	13	414.79
3	22 09	7	120.26	14	481.06
3¼	25.92	7¼	129.01	15	552.23
3½	30.07	7½	138.06	16	628.32
3¾	34.52	7¾	147.42	17	709.31
4	39.27	8	157.08	18	795.22
4¼	44.33	8¼	167.05	20	981.75
4½	49.70	8½	177.33	22	1187.92
4¾	55.38	8¾	187.91	24	1413.72

Rules for Obtaining Approximate Weight of Cast Iron.

Square of diameter multiplied by 2.46 equals weight of cast iron round bar 1 foot long.

To ascertain weight of cast iron columns or pipe subtract weight of inside diameter of shell from weight of outside diameter.

Square of the diameter divided by 5 equals approximately the weight of a circular cast iron plate 1 inch thick.

Rules for Obtaining Approximate Weight of Wrought Iron.

For Round Bars—*Rule:* Multiply the square of the diameter in inches by the length in feet, and that product by 2.6. The product will be the weight in pounds, nearly.

For Square and Flat Wrought Bars—*Rule:* Multiply the area of the end of the bar in inches by the length in feet, and that by 3.32. The product will be the weight in pounds, nearly.

To find the sectional area of a bar of wrought iron, given the weight per foot, multiply by 3 and divide by 10.

To find the weight per foot, given the area, divide by 3 and multiply by 10.

To Convert Weight of

Wrought Iron	into	Cast Iron	. . . .	× 0.928
"	"	" Steel	. . . .	× 1.014
"	"	" Zinc	. . . .	× 0.918
"	"	" Brass	. . . .	× 1.082
"	"	" Copper	. . . .	× 1.144
"	"	" Lead	. . . .	× 1.468
Square Iron	into	Round	. . . .	× .7854

Decimal Approximations Useful in Calculations,

Cubic inches,	× .267	= lbs.	average	cast iron.
" "	× .281	= "	"	wrought iron.
" "	× .283	= "	"	cast steel.
" "	× .3225	= "	"	copper.
" "	× .3037	= "	"	brass.
" "	× .26	= "	"	zinc.
" "	× .4103	= "	"	lead.
" "	× .2636	= "	"	tin.
" "	× .4908	= "	"	mercury.
Cylin. "	× .2065	= "	"	cast iron.
" "	× .2168	= "	"	wrought iron.
" "	× .2223	= "	"	cast steel.
" "	× .2533	= "	"	copper.
" "	× .2385	= "	"	brass.
" "	× .2042	= "	"	zinc.
" "	× .3223	= "	"	lead.
" "	× .207	= "	"	tin.
" "	× .3854	= "	"	mercury.

Weight of a Lineal Foot of Flat Bar Iron, in Lbs.

BIRMINGHAM GAUGE.

Breadth in Inches.	Thickness in Fractions of Inches.								
	¼	5-16	⅜	7-16	½	⅝	¾	⅞	1
1	.83	1.04	1.25	1.46	1.67	2.08	2.50	2.92	3.34
1⅛	.93	1.17	1.40	1.64	1.87	2.34	2.81	3.28	3.75
1¼	1.04	1.30	1.56	1.82	2.08	2.60	3.13	3.65	4.17
1⅜	1.14	1.43	1.72	2.00	2.29	2.87	3.44	4.01	4.59
1½	1.25	1.56	1.87	2.19	2.50	3.13	3.75	4.38	5.00
1⅝	1.35	1.69	2.03	2.37	2.71	3.39	4.07	4.70	5.43
1¾	1.46	1.82	2.19	2.55	2.92	3.65	4.38	5.11	5.84
1⅞	1.56	1.95	2.34	2.74	3.13	3.91	4.69	5.47	6.26
2	1.67	2.08	2.50	2.92	3.34	4.17	5.01	5.86	6.68
2⅛	1.77	2.21	2.66	3.10	3.55	4.43	5.32	6.21	7.10
2¼	1.87	2.34	2.81	3.28	3.76	4.69	5.63	6.57	7.52
2⅜	1.98	2.47	2.97	3.47	3.96	4.95	5.95	6.94	7.93
2½	2.08	2.60	3.13	3.65	4.17	5.21	6.26	7.30	8.35
2⅝	2.19	2.74	3.28	3.83	4.38	5.47	6.57	7.67	8.77
2¾	2.29	2.87	3.44	4.01	4.59	5.74	6.88	8.03	9.18
2⅞	2.40	3.00	3.60	4.20	4.80	6.00	7.20	8.40	9.60
3	2.50	3.13	3.75	4.38	5.01	6.26	7.51	8.76	10.02
3¼	2.71	3.39	4.07	4.74	5.43	6.78	8.14	9.49	10.86
3½	2.92	3.65	4.38	5.11	5.84	7.30	8.76	10.23	11.69
3¾	3.13	3.91	4.68	5.47	6.26	7.82	9.39	10.95	12.52
4	3.34	4.17	5.00	5.84	6.68	8.35	10.02	11.69	13.36
4¼	3.54	4.43	5.32	6.21	7.09	8.87	10.64	12.42	14.19
4½	3.75	4.69	5.63	6.57	7.51	9.39	11.27	13.15	15.03
4¾	4.06	4.95	5.94	6.94	7.93	9.91	11.89	13.88	15.86
5	4.17	5.21	6.26	7.30	8.35	10.44	12.52	14.61	16.70
5¼	4.38	5.47	6.57	7.67	8.76	11.06	13.14	15.34	17.53
5½	4.59	5.73	6.88	8.03	9.18	11.48	13.77	16.07	18.37
5¾	4.80	6.00	7.20	8.40	9.60	12.00	14.40	16.80	19.20
6	5.01	6.25	7.51	8.76	10.02	12.53	15.03	17.53	20.05

Wrought Iron, Assumed Weight.

A cubic foot . . . . . = 480 lbs.
A square foot, 1 inch thick . . . . = 40 "
A bar 1 inch square, 1 foot long . . . = 3⅓ "
A " 1 " " 1 yard long . . . = 10 "

GAUGES AND THEIR EQUIVALENTS.

No. 27,	equal	to	1/64	inch.	No. 12,	equal	to	7/64	inch.
" 21,	"	"	1/32	"	" 10,	"	"	1/8	"
" 18,	"	"	3/64	"	" 8,	"	"	11/64	"
" 16,	"	"	1/16	"	" 6,	"	"	3/16	"
" 14,	"	"	5/64	"	" 5,	"	"	7/32	"
" 13,	"	"	3/32	"	" 4,	"	"	1/4	"

TRUTH is as impossible to be soiled by any outward touch as the sunbeam.—*Lord Bacon.*

AMERICAN AND BIRMINGHAM WIRE GAUGES.

THICKNESS IN INCHES.

Haswell.

Gauge.	Thickness American Gauge.	Thickness Birmingham Gauge.	Gauge.	Thickness American Gauge.	Thickness Birmingham Gauge.
0000	.46	.454	17	.0452	.058
000	.4096	.425	18	.0403	.049
00	.3648	.38	19	.0359	.042
0	.3248	.34	20	.0319	.035
1	.2893	.30	21	.0284	.032
2	.2576	.284	22	.0253	.028
3	.2294	.259	23	.0225	.025
4	.2043	.238	24	.0201	.022
5	.1819	.22	25	.0179	.02
6	.1620	.203	26	.0160	018
7	.1443	.18	27	.0142	.016
8	.1285	.165	28	.0126	.014
9	.1144	.148	29	.0112	.013
10	.1019	.134	30	.01	.012
11	.0907	.12	31	.0089	.01
12	.0808	.109	32	0079	.009
13	.0719	.095	33	.007	.008
14	.0641	.083	34	.0063	007
15	.057	.072	35	.0056	.005
16	.0508	.065	36	005	.004

The Area of a Circle.

Of all plane figures, the circle is the most capacious, or has the greatest area within the same limits. It is geometrically demonstrable that it has the same area as a right-angled triangle with a base equal to its circumference, and a perpendicular equal to its radius, that is, half the product of the radius and circumference. It is obviously larger than any figure, of however many sides, inscribed within its perimeter, and smaller than any circumscribed polygon. As a result of laborious calculations on this basis (pushed in one instance to 600 places of decimals without reaching the end), it has been ascertained that the ratio of the diameter to the circumference of any circle (sufficient) exact for all practical purposes), is as 1 : 3.1416 (3.141592653+) or in whole numbers, approximately, as 7 : 22, or more nearly as 113 : 355. Hence, to find the circumference or diameter, the other quantity being known, multiply or divide by 3.1416; and to find the area, multiply half the diameter by half the circumference, or the square of the diameter by .7854 (3.1416÷4).

To find the surface of a globe, multiply the square of the diameter by 3.1416.

To find the solidity of a globe, multiply the cube of the diameter by .5236.

AREAS OF CIRCLES,

Advancing by eighths.

Diam.	AREAS.							
	0	⅛	¼	⅜	½	⅝	¾	⅞
0	.0	.0122	.0490	.1104	.1963	.3068	.4417	.6013
1	.7854	.9940	1.227	1.484	1.767	2.073	2.405	2.761
2	3.1416	3.546	3.976	4.430	4.908	5.411	5.939	64.91
3	7.068	7.669	8.295	8.946	9.621	10.32	11.04	11.79
4	12.56	13.36	14.18	15.03	15.90	16.80	17.72	18.66
5	19.63	20.62	21.64	22.69	23.75	24.85	25.96	27.10
6	28.27	29.46	30.67	31.91	33.18	34.47	35.78	37.12
7	38.48	39.87	41.28	42.71	44.17	45.66	47.17	48.70
8	50.26	51.84	53.45	55.08	56.74	58.42	60.13	61.86
9	63.61	65.39	67.20	69.02	70.88	72.75	74.69	76.58
10	78.54	80.51	82.51	84.54	86.59	88 66	90.76	92.88
11	95.03	97.20	99.40	101.6	103.8	106.1	108.4	110.7
12	113.0	115.4	117.8	120.2	122.7	125.1	127.6	130.1
13	132.7	135.2	137.8	140.5	143.1	145.8	148.4	151.2
14	153.9	156.6	159.4	162.2	165.1	167.9	170.8	173.7
15	176.7	179 6	182.6	185.6	188.6	191.7	194.8	197.9
16	201.0	204.2	207.3	210.5	213.8	217.0	220.3	223.6
17	226.9	230.3	233.7	237.1	240.5	243.9	247.4	250.9
18	254.4	258.0	261.5	265.1	268.8	272.4	276.1	279.8
19	283.5	287.2	291.0	294.8	298.8	302.4	306.3	310.2
20	314.1	318.1	322.0	326.0	330.0	334.1	338.1	342.2
21	346.3	350.4	354.6	358.8	363.0	367.2	371.5	375.8
22	380.1	384.4	388.8	393.2	397.6	402.0	406.4	410.9
23	415.4	420.0	424.5	429.1	433.7	438.3	443.0	447.6
24	452.3	457.1	461.8	466.6	471.4	476.2	481.1	485.9
25	490.8	495.7	500.7	505.7	510.7	515.7	520.7	525.8
26	530.9	536.0	541.1	546.3	551.5	556.7	562.0	567.2
27	572.5	577.8	583.2	588.5	593.9	599.3	604.8	610.2
28	615.7	621.2	626.7	632.3	637.9	643.5	649.1	654.8
29	660.5	666.2	671.9	677.7	683.4	689.2	695.1	700.9
30	706.8	712.7	718.6	724.6	730.6	736.6	742.6	748.6
31	754.8	760.9	767.0	773.1	779.3	785.5	791.7	798.0
32	804.3	810.6	816.9	823.2	829.6	836.0	842.4	848.8
33	855.3	861.8	868.3	874.9	881.4	888.0	894.6	901.3
34	907.9	914.7	921.3	928.1	934.8	941.6	948.4	955.3
35	962.1	969.0	975.9	982.8	989.8	996.8	1003.8	1010.8
36	1017.9	1025.0	1032.1	1039.2	1046.3	1053.5	1060.7	1068.0
37	1075.2	1082.5	1089.8	1097.1	1104.5	1111.8	1119.2	1126.7
38	1134.1	1141.6	1149.1	1156.6	1164.2	1171.7	1179.3	1186.9
39	1194.6	1202.3	1210.0	1217.7	1225.4	1233.2	1241.0	1248.8
40	1256.6	1264.5	1272.4	1280.3	1288.2	1296.2	1304.2	1312.2
41	1320.3	1328.3	1336.4	1344.5	1352.7	1360.8	1369.0	1377.2
42	1385.4	1393.7	1402.0	1410.3	1418.6	1427.0	1435.4	1443.8
43	1452.2	1460.7	1469.1	1477.6	1486.2	1494.7	1503.3	1511.9
44	1520.5	1529.2	1537.9	1546.6	1555.3	1564.0	1572.8	1581.6
45	1590.4	1599.3	1608.2	1617.0	1626.0	1634.9	1643.9	1652.9

CIRCUMFERENCES OF CIRCLES,

Advancing by eighths.

Diam.	CIRCUMFERENCES.							
	0	⅛	¼	⅜	½	⅝	¾	⅞
0	.0	.3927	.7854	1.178	1.570	1.963	2.356	2.748
1	3.141	3.534	3.927	4.319	4.712	5.105	5.497	5.890
2	6.283	6.675	7.068	7.461	7.854	8.246	8.639	9.032
3	9.424	9.817	10.21	10.60	10.99	11.38	11.78	12.17
4	12.56	12.95	13.35	13.74	14.13	14.52	14.92	15.31
5	15.70	16.10	16.49	16.88	17.27	17.67	18.06	18.45
6	18.84	19.24	19.63	20.02	20.42	20.81	21.20	21.59
7	21.99	22.38	22.77	23.16	23.56	23.95	24.34	24.74
8	25.13	25.52	25.91	26.31	26.70	27.09	27.48	27.88
9	28.27	28 66	29.05	29.45	29.84	30.23	30.63	31.02
10	31.41	31.80	32.20	32.59	32.98	33.37	33.77	34.16
11	34.55	34.95	35.34	35.73	36.12	36.52	36.91	37.30
12	37.69	38.09	38.48	38.87	39.27	39.66	40.05	40.44
13	40.84	41.23	41.62	42.01	42.41	42.80	43.19	43.58
14	43.98	44.37	44.76	45.16	45.55	45.94	46.33	46.73
15	47.12	47.51	47.90	48.30	48.69	49.08	49.48	49.87
16	50.26	50.65	51.05	51.44	51.83	52.22	52.62	53.01
17	53.40	53.79	54.19	54.58	54.97	55.37	55.76	56.15
18	56.54	56.94	57.33	57.72	58.11	58.51	58.90	59.29
19	59.69	60.08	60.47	60.86	61.26	61.65	62.04	62.43
20	62.83	63.22	63.61	64.01	64.40	64.79	65.18	65.58
21	65.97	66.36	66.75	67.15	67.54	67.93	68.32	68.72
22	69.11	69.50	69.90	70.29	70.68	71.07	71.47	71.86
23	72.25	72.64	73.04	73.43	73.82	74.22	74.61	75.00
24	75.39	75.79	76.18	76.57	76.96	77.36	77.75	78.14
25	78.54	78.93	79.32	79.71	80.10	80.50	80.89	81.28
26	81.68	82.07	82.46	82.85	83.25	83.64	84.03	84.43
27	84.82	85.21	85.60	86.00	86.39	86.78	87.17	87.57
28	87.96	88.35	88.75	89.14	89.53	89.92	90.32	90.71
29	91.10	91.49	91.89	92.28	92.67	93.06	93.46	93.85
30	94.24	94.64	95.03	95.42	95.81	96.21	96.60	96.99
31	97.39	97.78	98.17	98.57	98.96	99.35	99.75	100.14
32	100.53	100.92	101.32	101.71	102.10	102.49	102.89	103.29
33	103.67	104.07	104.46	104.85	105.24	105.64	106.03	106.42
34	106.81	107.21	107.60	107.99	108.39	108.78	109.17	109.56
35	109.96	110.35	110.74	111.13	111.53	111.92	112.31	112.71
36	113.10	113.49	113.88	114.28	114.67	115.06	115.45	115.85
37	116.24	116.63	117.02	117.42	117.81	118.20	118.61	118.99
38	119.38	119.77	120.17	120.56	120.95	121.34	121.74	122.13
39	122.52	122.92	123.31	123.70	124.09	124.49	124.88	125.27
40	125.66	126.06	126.45	126.84	127.24	127.63	128.02	128.41
41	128.81	129.20	127.59	129.98	130.38	130.77	131.16	131.55
42	131.95	132.34	132.73	133.13	133.52	133.91	134.30	134.70
43	135.09	135.48	135.87	136.27	136.66	137.05	137.45	137.84
44	138.23	138.62	139.02	139.41	139.80	140.19	140.59	140.98
45	141.37	141.76	142.16	142.55	142.94	143.34	143.73	144.12

Table of Decimal Equivalents of 8ths, 16ths, 32nds and 64ths of an Inch.

8ths.

$\frac{1}{8}$	= .125
$\frac{1}{4}$	= .250
$\frac{3}{8}$	= .375
$\frac{1}{2}$	= .500
$\frac{5}{8}$	= .625
$\frac{3}{4}$	= .750
$\frac{7}{8}$	= .875

16ths.

$\frac{1}{16}$	= .0625
$\frac{3}{16}$	= .1875
$\frac{5}{16}$	= .3125
$\frac{7}{16}$	= .4375
$\frac{9}{16}$	= .5625
$\frac{11}{16}$	= .6875
$\frac{13}{16}$	= .8125
$\frac{15}{16}$	= .9375

32nds.

$\frac{1}{32}$	= .03125
$\frac{3}{32}$	= .09375
$\frac{5}{32}$	= .15625
$\frac{7}{32}$	= .21875
$\frac{9}{32}$	= .28125
$\frac{11}{32}$	= .34375
$\frac{13}{32}$	= .40625
$\frac{15}{32}$	= .46875
$\frac{17}{32}$	= .53125
$\frac{19}{32}$	= .59375
$\frac{21}{32}$	= .65625
$\frac{23}{32}$	= .71875
$\frac{25}{32}$	= .78125
$\frac{27}{32}$	= .84375
$\frac{29}{32}$	= .90625
$\frac{31}{32}$	= .96875

64ths.

$\frac{1}{64}$	= .015625
$\frac{3}{64}$	= .046875
$\frac{5}{64}$	= .078125
$\frac{7}{64}$	= .109375
$\frac{9}{64}$	= .140625
$\frac{11}{64}$	= .171875
$\frac{13}{64}$	= .203125
$\frac{15}{64}$	= .234375
$\frac{17}{64}$	= .265625
$\frac{19}{64}$	= .296875
$\frac{21}{64}$	= .328125
$\frac{23}{64}$	= .359375
$\frac{25}{64}$	= .390625
$\frac{27}{64}$	= .421875
$\frac{29}{64}$	= .453125
$\frac{31}{64}$	= .484375
$\frac{33}{64}$	= .515625
$\frac{35}{64}$	= .546875
$\frac{37}{64}$	= .578125
$\frac{39}{64}$	= .609375
$\frac{41}{64}$	= .640625
$\frac{43}{64}$	= .671875
$\frac{45}{64}$	= .703125
$\frac{47}{64}$	= .734375
$\frac{49}{64}$	= .765625
$\frac{51}{64}$	= .796875
$\frac{53}{64}$	= .828125
$\frac{55}{64}$	= .859375
$\frac{57}{64}$	= .890625
$\frac{59}{64}$	= .921875
$\frac{61}{64}$	= .953125
$\frac{63}{64}$	= .984375

Handy Facts for Architects and Builders.

Pitch of tin, copper or tar-and-gravel roofs five-eighths of an inch to the foot and upwards.

The average weight of 20,000 men and women weighed at Boston was: Men, 141½ lbs.; women, 124½ lbs.

Smallest convenient size of slab for a 14-in. wash bowl, 21 by 24 in. Height of slab from floor, 2 ft. 6 in.

Urinals should be 2 ft. 2 in. between partitions; partitions 6 ft. high.

Space occupied by water-closets, 2 ft. 6 in. wide; 2 ft. deep.

Dimensions of double bed, 6 ft. 6 in. by 4 ft. 6 in.

Dimensions of single bed (in dormitories), 2 ft 8 in. by 6 ft. 6 in.

Dimensions of a bureau, 3 ft. 2 in. wide, 1 ft. 6 in. deep, and upwards.

Dimensions of a common wash-stand, 2 ft. 4 in. wide, 1 ft. 6 in. deep.

Dimensions of a barrel—Diameter of head, 17 in.; bung, 19 in.; length, 28 in.; volume, 7,680 cubic in.

Dimensions of billiard tables (Collender)—4 ft. by 8 ft.; 4 ft. 2 in. by 9 ft.; and 5 ft. by 10 ft. Size of room required respectively, 13 by 17; 14 by 18; 15 by 20.

Horse-stalls—Width, 3 ft. 10 in. to 4 ft., or else 5 ft. or over in width—nine feet long. Width should never be between 4 and 5 ft., as in that case the horse is liable to cast himself.

HORSE POWER OF STEAM ENGINES, ETC.

The *unit* of nominal power for steam engines, or the usual estimate of dynamical effect per minute of a horse, called by engineers a "horse power," is 33,000 pounds at a velocity of 1 foot per minute, or, the effect of a load of 200 pounds raised by a horse for 8 hours a day, at the rate of 2½ miles per hour, or 150 pounds at the rate of 220 feet per minute.

RULE.—Multiply the area of the piston in square inches by the average force of the steam in pounds and by the velocity of the piston in feet per minute; divide the product by 33,000, and $\frac{7}{10}$ of the quotient equal the effective power.

ANOTHER RULE.—The diameter of the piston in inches, multiplied by itself, multiplied by the stroke in inches, multiplied by the revolutions per minute (not the strokes), multiplied by the mean effective (average pressure per square inch on piston), multiplied by .00000397, gives the gross or indicated horse power.

For the net effective horse power, deduct from the above about ¼ for friction of the working parts.

The mean effective pressure can be accurately determined only by the aid of an indicator. When the indicator is not used, and in the calculation the boiler pressure is substituted for the mean effective pressure, deduct from the result obtained from 40 to 60 per cent. for loss by condensation and friction of steam pipes and passages, decrease of pressure in cylinder due to expansion, back pressure of exhaust, and friction of the working parts.

For engines from 20 to 60 horse power, an average of 50 per cent. may be deducted; for smaller engines, more.

The mean pressure in the cylinder when cutting off at

¼	stroke	equals	boiler	pressure	multiplied	by	.597
⅓	"	"	"	"	"	"	.670
⅜	"	"	"	"	"	"	.743
½	"	"	"	"	"	"	.847
⅝	"	"	"	"	"	"	.919
⅔	"	"	"	"	"	"	.937
¾	"	"	"	"	"	"	.966
⅞	"	"	"	"	"	"	.992

Best designed boilers, well set, with good draft and skillful firing, will evaporate from 7 to 10 lbs. of water per pound of first-

class coal. The average result is from 30 to 60 per cent. below this.

In calculating horse power of Tubular or Flue boilers, consider 15 square feet of heating surface equivalent to one *nominal* horse power.

One square foot of grate will consume on an average 12 lbs of coal per hour.

Steam engines, in economy, vary from 30 to 60 lbs. of feed water and from 2 to 7 lbs. of coal per hour per indicated H. P.

HORSE POWER OF BELTING.

A simple rule for ascertaining transmitting power of belting without first computing speed per minute that it travels, is as follows: Multiply diameter of pulley in inches by its number of revolutions per minute, and this product by width of the belt in inches; divide the product by 3,300 for single belting, or by 2,100 for double belting, and the quotient will be the amount of horse power that can be safely transmitted.

Table for Single Leather, Four Ply Rubber and Four Ply Cotton Belting, Belts not Overloaded.

1 INCH WIDE, 800 FEET PER MINUTE=1 HORSE POWER.

Speed in Ft per Min.	WIDTH OF BELTS IN INCHES.											
	2	3	4	5	6	8	10	12	14	16	18	20
	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.
400	1	1½	2	2½	3	4	5	6	7	8	9	10
600	1½	2¼	3	3¾	4½	6	7½	9	10½	12	13½	15
800	2½	3	4	5	6	8	10	12	14	16	18	20
1000	2	3¾	5	6¼	7½	10	12½	15	17½	20	22½	25
1200	3	4½	6	7½	9	12	15	18	21	24	27	30
1500	3¾	5¾	7½	9½	11½	15	18¾	22½	26½	30	33¾	37½
1800	4½	6¾	9	11¼	13½	18	22½	27	31½	36	40½	45
2000	5	7½	10	12½	15	20	25	30	35	40	45	50
2400	6	9	12	15	18	24	30	36	42	48	54	60
2800	7	10½	14	17½	21	28	35	42	49	56	63	70
3000	7½	11¼	15	18¾	22½	30	37½	45	52½	60	67½	75
3500	8¾	13	17½	22	26	35	44	52½	61	70	79	88
4000	10	15	20	25	30	40	50	60	70	80	90	100
4500	11¼	17	22½	28	34	45	57	69	78	90	102	114
5000	12½	19	25	31	37½	50	62½	75	87½	100	112	125

Double leather, six-ply rubber or six-ply cotton belting will transmit 50 to 75 per cent. more power than is shown in this table. (One inch wide, 550 feet per minute=one horse power.)

Table of Transmission of Power by Wire Ropes.

Diameter of Wheel in Ft.	Number of Revolutions.	Trade No. of Rope.	Diameter of Rope.	Horse Power.
4	80	23	$\frac{3}{8}$	3.3
4	100	23	$\frac{3}{8}$	4.1
4	120	23	$\frac{3}{8}$	5.0
4	140	23	$\frac{3}{8}$	5.8
5	80	22	$\frac{7}{16}$	6.9
5	100	22	$\frac{7}{16}$	8.6
5	120	22	$\frac{7}{16}$	10.3
5	140	22	$\frac{7}{16}$	12.1
6	80	21	$\frac{1}{2}$	10.7
6	100	21	$\frac{1}{2}$	13.4
6	120	21	$\frac{1}{2}$	16.1
6	140	21	$\frac{1}{2}$	18.7
7	80	20	$\frac{9}{16}$	16.9
7	100	20	$\frac{9}{16}$	21.1
7	120	20	$\frac{9}{16}$	25.3
7	140	20	$\frac{9}{16}$	29.6
8	80	19	$\frac{5}{8}$	22.0
8	100	19	$\frac{5}{8}$	27.5
8	120	19	$\frac{5}{8}$	33.0
8	140	19	$\frac{5}{8}$	38.5
9	80	20	$\frac{9}{16}$ $\frac{5}{8}$	40.0
		19		41.5
9	100	20	$\frac{9}{16}$ $\frac{5}{8}$	50.0
		19		51 9
9	120	20	$\frac{9}{16}$ $\frac{5}{8}$	60.0
		19		62.2
9	140	20	$\frac{9}{16}$ $\frac{5}{8}$	70 0
		19		72 6
10	80	19	$\frac{5}{8}$ $\frac{11}{16}$	55.0
		18		58.4
10	100	19	$\frac{5}{8}$ $\frac{11}{16}$	68 7
		18		73 0
10	120	19	$\frac{5}{8}$ $\frac{11}{16}$	82.5
		18		87 6
10	140	19	$\frac{5}{8}$ $\frac{11}{16}$	96.2
		18		102.2
11	80	19	$\frac{5}{8}$ $\frac{11}{16}$	64 9
		18		75 5
11	100	19	$\frac{5}{8}$ $\frac{11}{16}$	81 1
		18		94.4
11	120	19	$\frac{5}{8}$ $\frac{11}{16}$	97.3
		18		113.3
11	140	19	$\frac{5}{8}$ $\frac{11}{16}$	113.6
		18		132.1
12	80	18	$\frac{11}{16}$ $\frac{3}{4}$	93 4
		17		99.3
12	100	18	$\frac{11}{16}$ $\frac{3}{4}$	116 7
		17		124.1
12	120	18	$\frac{11}{16}$ $\frac{3}{4}$	140 1
		17		148 9
12	140	18	$\frac{11}{16}$ $\frac{3}{4}$	163 5
		17		173.7
13	80	18	$\frac{11}{16}$ $\frac{3}{4}$	112.0
		17		122.6
13	100	18	$\frac{11}{16}$ $\frac{3}{4}$	140 0
		17		153 2
13	120	18	$\frac{11}{16}$ $\frac{3}{4}$	168.0
		17		183.9
14	80	17	$\frac{3}{4}$ $\frac{7}{8}$	148.0
		16		141.0
14	100	17	$\frac{3}{4}$ $\frac{7}{8}$	185.0
		16		176.0
14	120	17	$\frac{3}{4}$ $\frac{7}{8}$	222.0
		16		211.0
15	80	17	$\frac{3}{4}$ $\frac{7}{8}$	217.0
		16		217.0
15	100	17	$\frac{3}{4}$ $\frac{7}{8}$	259.0
		16		259.0
15	120	17	$\frac{3}{4}$ $\frac{7}{8}$	300 0
		16		300.0

USEFUL HYDRAULIC INFORMATION.

A gallon of water (U. S. standard) weighs 8⅓ pounds and contains 231 cubic inches. A cubic foot of water weighs 62½ pounds, and contains 1,728 cubic inches or 7½ gallons.

Doubling the diameter of a pipe increases its capacity four times. Friction of liquids in pipes increases as the square of the velocity.

The mean pressure of the atmosphere is usually estimated at 14.7 pounds per square inch, so that with a perfect vacuum it will sustain a column of mercury 29.9 inches or a column of water 33.9 feet high.

To find the pressure in pounds per square inch of a column of water, multiply the height of the column in feet by .434. Approximately we say that every foot elevation is equal to ½ pound pressure per square inch; this allows for ordinary friction.

To find the diameter of a pump cylinder to move a given quantity of water per minute (100 feet of piston being the standard of speed), divide the number of gallons by 4, then extract the square root, and the product will be the diameter in inches of the pump cylinder.

To find quantity of water elevated in one minute running at 100 feet of piston speed per minute: Square the diameter of the water cylinder in inches and multiply by 4. Example: Capacity of a 5-inch cylinder is desired. The square of the diameter (5 inches) is 25, which, multiplied by 4, gives 100, the number of gallons per minute (approximately).

To find the horse power necessary to elevate water to a given height, multiply the total weight of the water in lbs. by the height in feet and divide the product by 33,000 (an allowance of 25 per cent. should be added for water friction, and a further allowance of 25 per cent. for loss in steam cylinder).

The area of the steam piston, multiplied by the steam pressure, gives the total amount of pressure that can be exerted. The area of the water piston multiplied by the pressure of water per square inch gives the resistance. A margin must be made between the power and the resistance to move the pistons at the required speed—say from 20 to 40 per cent., according to speed and other conditions.

To find the capacity of a cylinder in gallons. Multiplying the area in inches by the length of stroke in inches, will give the total number of cubic inches; divide this amount by 231 (which is the cubical contents of a U. S. gallon in inches), and the product is the capacity in gallons.

With the efficient working of pumps certain precautions are necessary. Following are a few hints that will be of service to persons interested in the subject:

Care should be exercised to prevent foreign substances from entering the suction

pipe. In case of such danger a strainer should be used and the total area of the strainer holes should be from two to five times the area of the pipe.

It is of great advantage to have the suction pipe as straight and free as possible. Elbows and valves obstruct the flow of water much more than usually supposed.

Above all other things, the suction pipe should be perfectly air-tight, as a very small leak will supply the pump with so much air that little or no water will be obtained.

It is advantageous, and, when high speed is desired, becomes a necessity, to connect a vacuum chamber to the suction pipe near the pump.

A foot-valve should be used on long or high suctions. Its area should be at least as much as the pipe.

If in an exposed position, the pump should be thoroughly drained after stopping, to prevent injury by frost, by means of the drain-cocks provided for the purpose.

When a pump is to remain idle for some time the steam cylinder should be well oiled before stopping.

The stuffing-boxes should be carefully packed so as not to necessitate them being screwed down too tight.

The most economical speed to run a pump is 100 feet per minute.

The friction of liquids in pipes increases as the square of the velocity.

To find the capacity of a Double-Acting Pump in U. S. gallons per minute, multiply together: the area of the water cylinder in inches; the length of the stroke in inches; the number of single strokes per minute. Divide the product by 231. For a Single-Acting Pump take half the number of single strokes.

For domestic use water should be kept in wooden or iron tanks. Zinc can be used to advantage. The use of lead-lined tanks is exceedingly dangerous, especially for keeping rain water.

CAPACITY OF CYLINDRICAL CISTERNS OR TANKS

FOR EACH FOOT OF DEPTH (U. S. GALLONS).

Diameter in Feet.	Gallons.	Pounds.	Diameter in Feet.	Gallons.	Pounds.
2.0	23.5	196	9.0	475.9	3,968
2.5	36.7	306	9.5	530.2	4,421
3.0	52.9	441	10.0	587.5	4,899
3.5	72.0	600	11.0	710.9	5,928
4.0	94.0	784	12.0	846.0	7,054
4.5	119.0	992	13.0	992.9	8,280
5.0	146.9	1,225	14.0	1,151.5	9,602
5.5	177.7	1,482	15.0	1,321.9	11,023
6.0	211.5	1,764	20.0	2,350.1	19,596
6.5	248.2	2,070	25.0	3,672.0	30,620
7.0	287.9	2,401	30.0	5,287.7	44,093
7.5	330.5	2,756	35.0	7,197.1	60,016
8.0	376.0	3,135	40.0	9,400.3	78,3 8
8.5	424.5	3,540	....	.....	.....

THE great philosopher, Plato, defined man as a featherless biped. Thereupon the shrewd old cynic, Diogenese, plucked the feathers from a goose, and, having labeled it "Plato's man," threw it over into the philosopher's class-room.

SIZE, CAPACITY, ETC., OF BOILERS.

LOCOMOTIVES.

Length.		Diam.	Fire Box	Dome.	Flues.		Length.		Area Chimney.	Capacity.
Ft.	in.	inches.	inches.	inches.		in.	ft.	in.	sq. inches.	sq. in.
7	3	36	30x30	16x16	46	2	4	6	138	850
7	3	42	30x36	16x20	48	2½	4	6	240	1100
8	3	42	36x36	16x20	48	2½	5		240	1250
10	3	42	36x36	20x24	48	2½	7		240	1725
12	3	42	36x42	24x24	40	3	8	6	280	2000
14	3	42	36x42	24x24	40	3	10	6	280	2500
10	3	48	42x36	24x24	50	3	7		350	2000
14	3	48	42x42	24x30	50	3	10	6	350	3000
16		48	42x48	30x30	50	3	11	9	350	3600

Shell ¼-in. C. H. No. 1 iron; heads and fire-box, $\frac{5}{16}$-in. C. H. No. 1 flange; wrought iron rings around fire door and in legs.

HORIZONTAL TUBULARS.

Length.	Diam.	Dome.	No. Flues.		Area Chimney.	Heating S.	Capacity.
Feet.	inches.	inches.		in.	sq. inches.	sq. inches.	sq. inches.
10	36	20x20	30	3	260	280	1400
12	36	20x24	30	3	260	330	1650
10	42	20x24	40	3	350	380	1900
12	42	24x24	40	3	350	440	2200
14	42	24x24	40	3	350	480	2400
16	42	24x30	40	3	350	560	2800
14	48	24x30	50	3	440	630	3150
16	48	24x30	50	3	440	725	3625
16	54	30x36	50	3½	625	850	4250
16	60	30x36	50	4	800	975	4875
18	60	30x36	50	4	800	1250	6250

Small boilers: Shell $\frac{5}{16}$-in. C. H. No. 1 iron; heads, $\frac{7}{16}$-in. C H. No. 1 flange iron.

Large boilers (54-in. and upwards): Shell ⅜-in. C. H. No. 1 iron; heads, ½-in. C. H. No. 1 flange iron.

BRICK CHIMNEYS.

Thickness of brick-work, one brick from top to twenty-five feet from top; a brick and a half from 25 to 50 ft. from top, increasing by half a brick for each additional 25 feet to bottom. The diameter at base should be not less than one-tenth the height. If the inside diameter at top exceed 4½ feet, the top length should be a brick and a half thick.

BOILER CHIMNEYS.

For marine boilers the general rule is to allow 14 sq. in. of chimney for each nominal horse-power. For stationary boilers the area of the chimneys should be one-fifth greater than the combined area of all the flues or tubes. Where boilers are provided with other means of draught the dimensions of the chimney are not so important.

Diameter and Height of Boiler Chimneys.

Horse pow'r of Boiler.	Height of Chimney.	Interior Diam. at Top.	Horse pow'r of Boiler.	Height of Chimney.	Interior Diam. at Top.
10	60 ft.	14 inches.	70	120 ft.	30 inches.
12	75 "	14 "	90	120 "	34 "
16	90 "	16 "	120	135 "	38 "
20	99 "	17 "	160	150 "	43 "
30	105 "	21 "	200	165 "	47 "
50	120 "	26 "	250	180 "	42 "
60	120 "	27 "	380	195 "	57 "

Table of the Principal Alloys.

A combination of copper and tin makes bath metal.

A combination of copper and zinc makes bell metal.

A combination of tin and copper makes bronze metal.

A combination of tin, antimony, copper and bismuth makes britannia metal.

A combination of tin and copper makes cannon metal.

A combination of copper and zinc makes Dutch gold.

A combination of copper, nickel and zinc, with sometimes a little iron and tin makes German silver.

A combination of gold and copper makes standard gold.

A combination of gold, copper and silver makes old-standard gold.

A combination of tin and copper makes gun metal.

A combination of copper and zinc makes mosaic gold.

A combination of tin and lead makes pewter.

A combination of lead and a little arsenic makes sheet metal.

A combination of silver and copper makes standard silver.

A combination of tin and lead makes solder.

A combination of lead and antimony makes type metal.

A combination of copper and arsenic makes white copper.

How to Mix Printing Inks and Paints in the Preparation of Tints.

THE FIRST NAMED COLOR ALWAYS PREDOMINATES.

Mixing dark green and purple makes bottle green.

Mixing white and medium yellow makes buff tint.

Mixing red, black and blue makes dark brown.

Mixing bronze, blue, lemon yellow and black makes dark green.

Mixing white, medium yellow and black makes drab tint.

Mixing white, lake and lemon yellow makes flesh tint.

Mixing lemon yellow and bronze blue makes grass-green.
Mixing white and black makes gray tint.
Mixing white and purple makes lavender tint.
Mixing red, black and medium yellow makes maroon.
Mixing lake and purple makes magenta.
Mixing medium yellow and purple makes olive green.
Mixing medium yellow and red makes orange.
Mixing white, ultramarine blue and black makes pearl tint.
Mixing white and lake makes pink.
Mixing ultramarine blue and lake makes purple.
Mixing orange, lake and purple makes russet.
Mixing medium yellow, red and white makes sienna.
Mixing white and ultramarine blue makes sky blue.
Mixing ultramarine blue, black and white makes slate.
Mixing vermillion and black makes Turkey red.
Mixing white, yellow, red and black makes umber.

Durability of Different Woods.

Experiments have been lately made by driving sticks, made of different woods, each two feet long and one and one-half inches square, into the ground, only one-half an inch projecting outward. It was found that in five years all those made of oak, elm, ash, fir, soft mahogany, and nearly every variety of pine, were totally rotten. Larch, hard pine and teak wood were decayed on the outside only, while acacia, with the exception of being also slightly attacked on the exterior, was otherwise sound. Hard mahogany and cedar of Lebanon were in tolerably good condition; but only Virginia cedar was found as good as when put in the ground. This is of some importance to builders, showing what woods should be avoided, and what others used by preference in underground work.

The duration of wood when kept dry is very great, as beams still exist which are known to be nearly 1,100 years old. Piles driven by the Romans prior to the Christian era have been examined of late, and found to be perfectly sound after an immersion of nearly 2,000 years.

The wood of some tools will last longer than the metals, as in spades, hoes and plows. In other tools the wood is first gone, as in wagons, wheelbarrows and machines. Such wood should be painted or oiled; the paint not only looks well, but preserves the wood; petroleum oil is as good as any other.

Hard wood stumps decay in five or six years; spruce stumps decay in about the same time; hemlock stumps in eight to nine years; cedar, eight to nine years; pine stumps, never.

Cedar, oak, yellow pine and chestnut are the most durable woods in dry places.

Timber intended for posts is rendered almost proof against rot by thorough seasoning, charring and immersion in hot coal tar.

Specific Gravity of Various Substances.

A gallon of water or wine weighs 10 lbs., and this is taken as the basis of the following table.

LIQUIDS.		TIMBER.		METALS.	
Water	100	Cork	24	Zinc	719
Sea water	103	Poplar	38	Cast iron	721
Dead Sea	124	Fir	55	Tin	729
Alcohol	84	Cedar	61	Bar iron	779
Olive oil	92	Pear	66	Steel	783
Turpentine	99	Walnut	67	Copper	869
Wine	100	Cherry	72	Brass	840
Urine	101	Maple	75	Silver	1,051
Cider	102	Apple	79	Lead	1,135
Beer	102	Ash	84	Mercury	1,357
Woman's milk	102	Beech	85	Gold	1,926
Cow's "	103	Mahogany	106	Platina	1,950
Goat's "	104	Oak	117		
Porter	104	Ebony	133		

PRECIOUS STONES.					
Emerald	277.5	Diamond	353.0	Garnet	406.3
Crystal	265.3	Topaz	401.1	Ruby	428.3

SUNDRIES.					
Indigo	77	Peat	133	Porcelain	226
Gunpowder	93	Opium	134	Stone	252
Butter	94	Honey	145	Marble	270
Ice	117	Ivory	183	Granite	278
Clay	120	Brick	200	Chalk	279
Coal	130	Sulphur	203	Glass	289

Weight in Cubic Feet.

	Lbs. per Cub. Ft.		Lbs. per Cub. Ft.
Cork	15	Brick	120
Cedar	36	Stone	150
Beech	51	Granite	166
Butter	56	Glass	172
Water	62	Iron	470
Mahogany	66	Copper	520
Ice	70	Silver	630
Oak	70	Lead	680
Clay	72	Gold	1,155
Coal	80		

Tensile and Transverse Strength

A crushing force of 1,000 lbs. per square inch on a bar 1 inch square, and 12 inches long, gives the following ratios of strength:

	Tensile.	Transverse.		Tensile.	Transverse.
Stone	100	10	Cast iron	158	20
Glass	123	10	Timber	1,900	85

Tensile Test of Steel.

BAR 8 INCHES LONG.

Sq. Inch Section.	Strain, Tons per Sq. Inch.	Extension, Inches.	Sq. Inch Section.	Strain, Tons per Sq. Inch.	Extension, Inches.
1.0000	13.93	.01	.8325	28.35	1.40
.9799	16.96	.10	.7088	27.32	2.00
.9331	23.43	.40	.5541	25.05	2.20
.8741	27.23	1.00			

Elastic Limit	17.40 tons.	Cohesion	45.21 tons.
Maximum strain	28.35 "	Extension	27½ per cent.
Breaking load	25.05 "	Contraction	44½ "

Taking the strength of Swedish iron at 100, the tensile strength of steel compares thus:

Swedish iron	100	Cannon steel	173
Boiler steel	118	Spring steel	202

Pecuniary Value of Metals.

Few people have any idea of the value of precious metals other than gold, silver and copper, which are commonly supposed to be the most precious of all. There are many metals more valuable and infinitely rarer. The following table gives the names and prices of all the known metals of pecuniary worth:

	Price per Av. pound.		Price per Av. pound.
Vanadium	$10,000 00	Gold	$ 330 00
Rubidium	9.070 00	Molybdenum	225 00
Zirconium	7,200 00	Thallium	225 00
Lithium	7,000 00	Platinum	150 00
Glucium	5,400 00	Manganese	130 00
Calcium	4,500 00	Tungstein	115 00
Strontium	4,200 00	Magnesium	64 00
Terbium	4,080 00	Potassium	64 00
Vitrium	4,080 00	Aluminum	32 00
Erbium	3,400 00	Silver	20 00
Cerium	3,400 00	Cobalt	16 00
Didymium	3,200 00	Sodium	8 00
Indium	3,200 00	Nickel	5 00
Ruthenium	2,400 00	Cadmium	4 00
Rhodium	2,300 00	Bismuth	2 50
Niobium	2,300 00	Mercury	95
Barium	1,800 00	Arsenic	50
Palladium	1,400 00	Tin	25
Osmium	1,300 00	Copper	25
Iridium	1,090 00	Antimony	16
Uranium	900 00	Zinc	11
Titanium	689 00	Lead	08
Chromium	500 00		

VALUE OF METALS AS CONDUCTORS.

	Heat.	Electricity.		Heat.	Electricity.
Gold	100	94	Iron	37	16
Platinum	98	16	Zinc	36	29
Silver	97	74	Tin	30	15
Copper	90	100	Lead	18	8

TENACITY OF METALS.

A wire, 0.84 of a line in diameter, will sustain weights as follows:

Lead	28 lbs.	Silver	187 lbs.
Tin	35 "	Platinum	274 "
Zinc	110 "	Copper	302 "
Gold	150 "	Iron	549 "

FLUID DENSITY OF METALS.

Zinc	6.48	Copper	8.22
Iron	6.88	Silver	9.51
Tin	7.03	Lead	10.37

TABLE OF SQUARES AND CUBES

OF

ALL NUMBERS FROM 1 TO 500.

No.	Squares.	Cubes.	No.	Squares.	Cubes.
1	1	1	55	30 25	166 375
2	4	8	56	31 36	175 616
3	9	27	57	32 49	185 193
4	16	64	58	33 64	195 112
5	25	1 25	59	34 81	205 379
6	36	2 16	60	36 00	216 000
7	49	3 43	61	37 21	226 981
8	64	5 12	62	38 44	238 328
9	81	7 29	63	39 69	250 047
10	1 00	1 000	64	40 96	262 144
11	1 21	1 331	65	42 25	274 626
12	1 44	1 728	66	43 56	287 496
13	1 69	2 197	67	44 89	300 763
14	1 96	2 744	68	46 24	314 432
15	2 25	3 375	69	47 61	328 509
16	2 56	4 096	70	49 00	343 000
17	2 89	4 913	71	50 41	357 911
18	3 24	5 832	72	51 84	373 248
19	3 61	6 859	73	53 29	389 017
20	4 00	8 000	74	54 76	405 224
21	4 41	9 261	75	56 25	421 875
22	4 84	10 648	76	57 76	438 976
23	5 29	12 167	77	59 29	456 533
24	5 76	13 824	78	60 84	474 552
25	6 25	15 625	79	62 41	493 039
26	6 76	17 576	80	64 00	512 000
27	7 29	19 683	81	65 61	531 441
28	7 84	21 952	82	67 24	551 368
29	8 41	24 389	83	68 89	571 787
30	9 00	27 000	84	70 56	592 704
31	9 61	29 791	85	72 25	614 125
32	10 24	32 768	86	73 96	636 056
33	10 89	35 937	87	75 69	658 503
34	11 56	39 304	88	77 44	681 472
35	12 25	42 875	89	79 21	704 969
36	12 96	46 656	90	81 00	729 000
37	13 69	50 653	91	82 81	753 571
38	14 44	54 872	92	84 64	778 688
39	15 21	59 319	93	86 49	804 357
40	16 00	64 000	94	88 36	830 584
41	16 81	68 921	95	90 25	857 375
42	17 64	74 088	96	92 16	884 736
43	18 49	79 507	97	94 09	912 673
44	19 36	85 184	98	96 04	941 192
45	20 25	91 125	99	98 01	970 299
46	21 16	97 336	100	1 00 00	1 000 000
47	22 09	103 823	101	1 02 01	1 030 301
48	23 04	110 592	102	1 04 04	1 061 298
49	24 01	117 649	103	1 06 09	1 092 727
50	25 00	125 000	104	1 08 16	1 124 864
51	26 01	132 651	105	1 10 25	1 157 625
52	27 04	140 608	106	1 12 36	1 191 016
53	28 09	148 877	107	1 14 49	1 225 043
54	29 16	157 464	108	1 16 64	1 259 712

No.	Squares.	Cubes.	No.	Squares.	Cubes.
109	1 18 81	1 295 029	169	2 85 61	4 826 809
110	1 21 00	1 331 000	170	2 89 00	4 913 000
111	1 23 21	1 367 631	171	2 92 41	5 000 211
112	1 25 44	1 404 928	172	2 95 84	5 088 448
113	1 27 69	1 442 897	173	2 99 29	5 177 717
114	1 29 96	1 481 544	174	3 02 76	5 268 024
115	1 32 25	1 520 875	175	3 06 25	5 359 375
116	1 34 56	1 560 896	176	3 09 76	5 451 776
117	1 36 89	1 601 613	177	3 13 29	5 545 233
118	1 39 24	1 643 032	178	3 16 84	5 639 752
119	1 41 61	1 685 159	179	3 20 41	5 735 339
120	1 44 00	1 728 000	180	3 24 00	5 832 000
121	1 46 41	1 771 561	181	3 27 61	5 929 741
122	1 48 84	1 815 848	182	3 31 24	6 028 568
123	1 51 29	1 860 867	183	3 34 89	6 128 487
124	1 53 76	1 906 624	184	3 38 56	6 229 504
125	1 56 25	1 953 125	185	3 42 25	6 331 625
126	1 58 76	2 000 376	186	3 45 96	6 434 856
127	1 61 29	2 048 383	187	3 49 69	6 539 203
128	1 63 84	2 097 152	188	3 53 44	6 644 672
129	1 66 41	2 146 689	189	3 57 21	6 751 269
130	1 69 00	2 197 000	190	3 61 00	6 859 000
131	1 71 61	2 248 091	191	3 64 81	6 967 871
132	1 74 24	2 299 968	192	3 68 64	7 077 888
133	1 76 89	2 352 637	193	3 72 49	7 189 057
134	1 79 56	2 406 104	194	3 76 36	7 301 384
135	1 82 25	2 460 375	195	3 80 25	7 414 875
136	1 84 96	2 515 456	196	3 84 16	7 529 536
137	1 87 69	2 571 353	197	3 88 09	7 645 373
138	1 90 44	2 628 072	198	3 92 04	7 762 392
139	1 93 21	2 685 619	199	3 96 01	7 880 599
140	1 96 00	2 744 000	200	4 00 00	8 000 000
141	1 98 81	2 803 221	201	4 04 01	8 120 601
142	2 01 64	2 863 288	202	4 08 04	8 242 408
143	2 04 49	2 924 207	203	4 12 09	8 365 427
144	2 07 36	2 985 984	204	4 16 16	8 489 664
145	2 10 25	3 048 625	205	4 20 35	8 615 125
146	2 13 16	3 112 136	206	4 24 36	8 741 816
147	2 16 09	3 176 523	207	4 28 49	8 869 743
148	2 19 04	3 241 792	208	4 32 64	8 998 912
149	2 22 01	3 307 949	209	4 36 81	9 129 329
150	2 25 00	3 375 000	210	4 41 00	9 261 000
151	2 28 01	3 442 951	211	4 45 21	9 393 931
152	2 31 04	3 511 808	212	4 49 44	9 528 128
153	2 34 09	3 581 577	213	4 53 69	9 663 597
154	2 37 16	3 652 264	214	4 57 96	9 800 344
155	2 40 25	3 723 875	215	4 62 25	9 938 375
156	2 43 36	3 796 416	216	4 66 56	10 077 646
157	2 46 49	3 869 893	217	4 70 89	10 218 313
158	2 49 64	3 944 312	218	4 75 24	10 360 232
159	2 52 81	4 019 679	219	4 79 61	10 503 459
160	2 56 00	4 096 000	220	4 84 00	10 648 000
161	2 59 21	4 173 281	221	4 88 41	10 793 861
162	2 62 44	4 251 528	222	4 92 84	10 941 048
163	2 65 69	4 330 747	223	4 97 29	11 089 567
164	2 68 96	4 410 944	224	5 01 76	11 239 424
165	2 72 25	4 492 125	225	5 06 25	11 390 625
166	2 75 56	4 574 296	226	5 10 76	11 543 176
167	2 78 89	4 657 463	227	5 15 29	11 697 083
168	2 82 24	4 741 632	228	5 19 84	11 852 352

No.	Squares.	Cubes.	No.	Squares.	Cubes.
229	5 24 41	12 008 989	289	8 35 21	24 137 569
230	5 29 00	12 167 000	290	8 41 00	24 389 000
231	5 33 61	12 326 391	291	8 46 81	24 642 171
232	5 38 24	12 487 168	292	8 52 64	24 897 088
233	5 42 89	12 649 337	293	8 58 49	25 153 757
234	5 47 56	12 812 904	294	8 64 36	25 412 184
235	5 52 25	12 977 875	295	8 70 25	25 672 375
236	5 56 96	13 144 256	296	8 76 16	25 934 336
237	5 61 69	13 312 053	297	8 82 09	26 198 073
238	5 66 44	13 481 272	298	8 88 04	26 463 592
239	5 71 21	13 651 919	299	8 94 01	26 730 899
240	5 76 00	13 824 000	300	9 00 00	27 000 000
241	5 80 81	13 997 521	301	9 06 01	27 270 901
242	5 85 64	14 172 488	302	9 12 04	27 543 608
243	5 90 49	14 348 907	303	9 18 09	27 818 127
244	5 95 36	14 526 784	304	9 24 16	28 094 464
245	6 00 25	14 706 125	305	9 30 25	28 372 625
246	6 05 16	14 886 936	306	9 36 36	28 652 616
247	6 10 09	15 069 223	307	9 42 49	28 934 443
248	6 15 04	15 252 992	308	9 48 64	29 218 112
249	6 20 01	15 438 249	309	9 54 81	29 503 629
250	6 25 05	15 625 000	310	9 61 00	29 791 000
251	6 30 01	15 813 251	311	9 67 21	30 080 231
252	6 35 04	16 003 008	312	9 73 44	30 371 328
253	6 40 09	16 194 277	313	9 79 69	30 664 297
254	6 45 16	16 387 064	314	9 85 96	30 959 144
255	6 50 25	16 581 375	315	8 92 25	31 255 875
256	6 55 36	16 777 216	316	9 98 56	31 554 496
257	6 60 49	16 974 593	317	10 04 89	31 855 013
258	6 65 64	17 173 512	318	10 11 24	32 157 432
259	6 70 81	17 373 979	319	10 17 61	32 461 759
260	6 76 00	17 576 000	320	10 24 00	32 768 000
261	6 81 21	17 779 581	321	10 30 41	33 076 161
262	6 86 44	17 984 728	322	10 36 84	33 386 248
263	6 91 69	18 191 447	323	10 43 29	33 698 267
264	6 96 96	18 399 744	324	10 49 76	34 012 224
265	7 02 25	18 609 625	325	10 56 25	34 328 125
266	7 06 56	18 821 096	326	10 62 76	34 645 976
267	7 12 89	19 034 163	327	10 69 29	34 965 783
268	7 18 24	19 248 832	328	10 75 84	35 287 552
269	7 23 61	19 465 109	329	10 82 41	35 611 289
270	7 29 00	19 683 000	330	10 89 00	35 937 000
271	7 34 41	19 902 511	331	10 95 61	36 264 691
272	7 39 84	20 123 648	332	11 02 24	36 594 368
273	7 45 29	20 346 417	333	11 08 89	36 926 037
274	7 50 76	20 570 824	334	11 15 56	37 259 704
275	7 56 25	20 796 875	335	11 22 25	37 595 375
276	7 61 76	21 024 576	336	11 28 96	37 933 056
277	7 67 29	21 253 933	337	11 35 69	38 272 753
278	7 72 84	21 484 952	338	11 42 44	38 614 472
279	7 78 41	21 717 639	339	11 49 21	38 958 219
280	7 84 00	21 952 000	340	11 56 00	39 304 000
281	7 89 61	22 188 041	341	11 62 81	39 651 821
282	7 95 24	22 425 768	342	11 69 64	40 001 688
283	8 00 89	22 665 187	343	11 76 49	40 353 607
284	8 06 56	22 906 304	344	11 83 36	40 707 584
285	8 12 25	23 149 125	345	11 90 25	41 063 625
286	8 17 96	23 393 656	346	11 97 16	41 421 736
287	8 23 69	23 639 903	347	12 04 09	41 781 923
288	8 29 44	23 887 872	348	12 11 04	42 144 192

TABLE OF SQUARES AND CUBES—*Continued.*

No.	Squares.	Cubes.	No.	Squares.	Cubes.
349	12 18 01	42 508 549	409	16 72 81	68 417 929
350	12 25 00	42 875 000	410	16 81 00	68 921 000
351	12 32 01	43 243 551	411	16 89 21	69 426 531
352	12 39 04	43 614 208	412	16 97 44	69 934 528
353	12 46 09	43 986 977	413	17 05 69	70 444 997
354	12 53 16	44 361 864	414	17 13 96	70 957 944
355	12 60 25	44 738 875	415	17 22 25	71 473 375
356	12 67 36	45 118 016	416	17 30 56	71 991 296
357	12 74 49	45 499 293	417	17 38 89	72 511 713
358	12 81 64	45 832 712	418	17 47 24	73 034 632
359	12 88 81	46 268 279	419	17 55 61	73 560 059
360	12 96 00	46 656 000	420	17 64 00	74 088 000
361	13 03 21	47 045 881	421	17 72 41	74 618 461
362	13 10 44	47 437 928	422	17 80 84	75 151 448
363	13 17 69	47 832 147	423	17 89 29	75 686 967
364	13 24 96	48 228 544	424	17 97 76	76 225 024
365	13 32 25	48 627 125	425	18 06 25	76 765 625
566	13 39 56	49 027 896	426	18 14 76	77 308 776
367	13 46 89	49 430 863	427	18 23 29	77 854 483
368	13 54 24	49 836 032	428	18 31 84	78 402 752
369	13 61 61	50 243 409	429	18 40 40	78 953 589
370	13 69 00	50 653 000	430	18 49 00	79 507 000
371	13 76 41	51 064 811	431	18 57 61	80 062 991
372	13 83 84	51 478 848	432	18 66 24	80 621 568
373	13 91 29	51 895 117	433	18 74 89	81 182 737
374	13 98 76	52 313 624	434	18 83 56	81 746 504
375	14 06 25	52 734 375	435	18 92 25	82 312 875
376	14 13 76	53 157 376	436	19 00 96	82 881 856
377	14 21 29	53 582 633	437	19 09 69	83 453 453
378	14 28 84	54 010 152	438	19 18 44	84 027 672
379	14 36 41	54 439 939	439	19 27 21	84 604 519
380	14 44 00	54 872 000	440	19 36 00	85 184 000
381	14 51 61	55 306 341	441	19 44 81	85 766 121
382	14 59 24	55 742 968	442	19 53 64	86 350 888
383	14 66 89	56 181 887	443	19 62 49	86 938 307
384	14 74 56	56 623 104	444	19 71 36	87 528 284
385	14 82 25	56 066 625	445	19 80 25	88 121 125
386	14 89 96	57 512 456	446	19 89 16	88 716 536
387	14 97 69	57 960 603	447	20 98 09	89 314 623
388	15 05 44	58 411 072	448	20 07 04	89 915 392
389	15 13 21	58 863 869	449	20 16 01	90 518 849
390	15 21 00	59 319 000	450	20 25 00	91 125 000
391	15 28 81	59 776 471	451	20 34 01	91 733 751
392	15 36 64	60 236 288	452	20 43 04	92 345 408
393	15 44 49	60 698 457	453	20 52 09	92 959 677
394	15 52 36	61 162 984	454	20 61 16	93 576 664
395	15 60 25	61 629 875	455	20 70 25	94 196 375
396	15 68 16	62 099 136	456	20 79 36	94 818 816
397	15 76 09	62 570 773	457	20 88 49	95 443 993
398	15 84 04	63 044 792	458	21 97 64	96 071 912
399	15 92 01	63 521 199	459	21 06 81	96 702 579
400	16 00 00	64 000 000	460	21 16 00	97 336 000
401	16 08 01	64 481 201	461	21 25 21	97 972 181
402	16 61 04	64 964 808	462	21 34 44	98 611 128
403	16 24 09	65 450 827	463	21 43 69	99 252 847
404	16 32 16	65 939 264	464	21 52 96	99 897 344
405	16 40 25	66 430 125	465	21 62 25	100 554 625
406	16 48 36	66 923 416	466	21 71 56	101 194 696
407	16 56 49	67 419 143	467	21 80 89	101 847 563
408	16 64 64	67 917 321	468	21 90 24	102 503 232

No.	Squares.	Cubes.	No.	Squares.	Cubes.
469	21 99 61	103 161 709	485	23 52 25	114 084 125
470	22 09 00	103 823 000	486	23 61 96	114 791 256
471	22 18 41	104 487 111	487	23 71 69	115 501 303
472	22 27 84	105 154 048	488	23 81 44	116 214 572
473	22 37 29	105 823 817	489	23 91 21	116 930 169
474	22 46 76	106 496 424	490	24 01 00	117 649 000
475	22 56 25	107 171 875	491	24 10 81	118 370 771
476	22 65 76	107 850 176	492	24 20 64	119 095 488
477	22 75 29	103 531 333	493	24 30 49	119 823 157
473	22 84 84	109 215 352	494	24 40 36	120 553 784
479	22 94 41	109 902 239	495	24 50 25	121 287 375
480	23 04 00	110 592 000	496	24 60 16	122 023 936
481	23 13 61	111 284 641	497	24 70 09	122 763 473
482	23 23 24	111 980 168	498	24 80 04	123 505 992
483	23 32 89	112 678 587	499	24 90 01	124 251 499
484	23 42 56	113 379 904	500	25 00 00	125 000 000

LENGTH OF CIRCULAR ARC.

Huygens' approximation to length of a circular arc:

A = Chord of any circular arc.
B = Chord of half that arc.
R = Radius of the circular arc.
L = Length of the circular arc.
Then

$$L = \frac{8B - A}{3}.$$

Or, as it is usually written,

$$L = 2B + \tfrac{1}{3}(2B - A).$$

WEDDING ANNIVERSARIES.

First, cotton; second, paper; third, leather; fifth, wooden; seventh, woolen; tenth, tin; twelfth, silk and fine linen; fifteenth, crystal; twentieth, china; twenty-fifth, silver; thirtieth, pearl; fortieth, ruby; fiftieth, golden; seventy-fifth, diamond.

YOUR BIRTHDAY.

Born on Monday, fair in face;
Born on Tuesday, full of God's grace;
Born on Wednesday, the best to be had;
Born on Thursday, merry and glad;
Born on Friday, worthily given;
Born on Saturday, work hard for a living;
Born on Sunday, shall never know want.

AN indenture is a deed or instrument in writing. Originally such writings were made in duplicate upon a sheet of paper which was afterwards indented or cut apart in a waved or notched line. One piece was given to each of the parties to the contract, and when the two were put together they would, of course, fit into each other exactly. This mode of indenture has passed out of use, but the term survives.

Deg.	Sine.	Cover.	Cosecnt.	Tangt.	Cotang.	Secant.	Versin.	Cosin.	Deg.
0	.00	1.00000	Infinite.	.0	Infinite.	1.00000	.0	1.00000	90
1	.01745	.98254	57.2986	.01745	57.2899	1.00015	.0001	.99984	89
2	.03489	.96510	28.6537	.03492	28.6362	1.00060	.0006	.99939	88
3	.05233	.94766	19.1073	.05240	19.0811	1.00137	.0013	.99862	87
4	.06975	.93024	14.3355	.06992	14.3006	1.00244	.0024	.99756	86
5	.08715	.91284	11.4737	.08748	11.4300	1.00381	.0038	.99619	85
6	.10452	.89547	9.5667	.10510	9.5143	1.00550	.0054	.99452	84
7	.12186	.87813	8.2055	.12278	8.1443	1.00750	.0074	.99254	83
8	.13917	.86082	7.1852	.14054	7.1153	1.00982	.0097	.99026	82
9	.15643	.84356	6.3924	.15838	6.3137	1.01246	.0123	.98768	81
10	.17364	.82635	5.7587	.17632	5.6712	1.01542	.0151	.98480	80
11	.19080	.80919	5.2408	.19438	5.1445	1.01871	.0183	.98162	79
12	.20791	.79208	4.8097	.21255	4.7046	1.02234	.0218	.97814	78
13	.22495	.77504	4.4454	.23086	4.3314	1.02630	.0256	.97437	77
14	.24192	.75807	4.1335	.24932	4.0107	1.03061	.0297	.97029	76
15	.25881	.74118	3.8637	.26794	3.7320	1.03527	.0340	.96592	75
16	.27563	.72436	3.6279	.28674	3.4874	1.04029	.0387	.96126	74
17	.29237	.70762	3.4203	.30573	3.2708	1.04569	.0436	.95630	73
18	.30901	.69098	3.2360	.32491	3.0776	1.05146	.0489	.95105	72
19	.32556	.67443	3.0715	.34432	2.9042	1.05762	.0544	.94551	71
20	.34202	.65797	2.9238	.36397	2.7474	1.06417	.0603	.93969	70
21	.35836	.64163	2.7904	.38386	2.6050	1.07114	.0664	.93358	69
22	.37460	.62539	2.6694	.40402	2.4750	1.07853	.0728	.92718	68
23	.39073	.60926	2.5593	.42447	2.3558	1.08636	.0794	.92050	67
24	.40673	.59326	2.4585	.44522	2.2460	1.09463	.0864	.91354	66
25	.42261	.57738	2.3662	.46630	2.1445	1.10337	.0936	.90630	65
26	.43837	.56162	2.2811	.48773	2.0503	1.11260	.1012	.89879	64
27	.45399	.54600	2.2026	.50952	1.9626	1.12232	.1089	.89100	63
28	.46947	.53052	2.1300	.53170	1.8807	1.13257	.1170	.88294	62
29	.48480	.51519	2.0626	.55430	1.8040	1.14335	.1253	.87461	61
30	.50000	.50000	2.0000	.57735	1.7320	1.15470	.1339	.86602	60
31	.51503	.48496	1.9416	.60086	1.6642	1.16663	.1428	.85716	59
32	.52991	.47008	1.8870	.62486	1.6003	1.17917	.1519	.84804	58
33	.54463	.45536	1.8360	.64940	1.5398	1.19236	.1613	.83867	57
34	.55919	.44080	1.7882	.67450	1.4825	1.20621	.1709	.82903	56
35	.57357	.42642	1.7434	.70020	1.4281	1.22077	.1808	.81915	55
36	.58778	.41221	1.7013	.72654	1.3763	1.23606	.1909	.80901	54
37	.60181	.39818	1.6616	.75355	1.3270	1.25213	.2013	.79863	53
38	.61566	.38433	1.6242	.78128	1.2799	1.26901	.2119	.78801	52
39	.62932	.37067	1.5890	.80978	1.2348	1.28675	.2228	.77714	51
40	.64278	.35721	1.5557	.83909	1.1917	1.30540	.2339	.76604	50
41	.65605	.34394	1.5242	.86928	1.1503	1.32501	.2452	.75470	49
42	.66913	.33086	1.4944	.90040	1.1106	1.34563	.2568	.74314	48
43	.68199	.31800	1.4662	.93251	1.0723	1.36732	.2686	.73135	47
44	.69465	.30534	1.4395	.96568	1.0355	1.39016	.2806	.71933	46
45	.70710	.29289	1.4142	1.00000	1.0000	1.41421	.2928	.70710	45
	Cosin.	Versin.	Secant.	Cotang.	Tangt.	Cosecnt.	Cover.	Sine.	

THE term bankrupt originated in connection with the money-changers of Italy. They sat in the market-place with their money displayed on a bench (or *banc*, as it was called) before them. When one of these financial gentlemen failed his banc (or bench) was said to be broken, and he was styled a bankrupt. The modern bank inherits its name from the unimposing money-bench (banc) of mediæval Italy.

Useful Information for Printers and Publishers.

Standard Newspaper Measure.

The standard newspaper measure, as recognized and now in general use, is 13 ems pica. The standard of measurement of all sizes of type is the em quad, not the letter m.

Leads and Slugs.

Leads are designated as "—to-pica," the number being that fraction of a pica which the lead is, viz.: a 6-to-pica lead is one-sixth of a pica in thickness, or six 6-to-pica's are equal to one pica; four 4-to-pica's one pica, and so with other sizes or thicknesses of leads.

SLUGS—"Leads" of nonpareil thickness and greater are called slugs, viz.: nonpareil slugs, brevier slugs, pica slugs, etc.

Average Weight of Matter.

A "piece" of solid matter 13 ems pica wide and 6 inches long will weigh about 3⅜ lbs., but, in order to allow for the sorts usually remaining in case, 4⅜ lbs. of type would be required to set that amount of solid matter. When the matter is to be leaded the weight of the type may be reduced about one-quarter, *i. e.*, a single column of six-column folio, solid, will weigh 10⅛ lbs., requiring about 13 lbs. of type, while the same length column, leaded with 6-to-pica leads, will contain but 7⅞ lbs. solid matter, requiring about 10 lbs. of type to set the same.

EXAMPLE—A single page of regular six-column folio or quarto (13x19¾) contains 256¾ square inches of matter:

256¾×4⅜÷13 (square inches of 4⅜ lbs. of type) =86+,

the number of pounds of type required to set that amount of matter, including sorts in case.

How to Estimate for Body Type.

To estimate the quantity of type (solid) necessary to fill a given space, multiply the number of square inches by 5⅜ (estimated weight, in ounces, of one square inch of matter, including sorts in case) divide the product by 16, and the result will be the weight of type required. If leaded, a reduction in weight of type may be made as above.

EXAMPLE—A single page of regular six-column folio or quarto (13x19¾) contains 256¾ square inches of matter:

256¾×5⅜÷16=86+,

the number of pounds of type required to set that amount of matter, including sorts in case.

Miscellaneous Information.

The following table gives the number of "ems" in a space 6x13 ems pica, also the average number of "ems" in 4 ounces:

Number of Ems in	Pearl	Agate	No'pl	Min'n	Brev'r	Bourg	Lg. Pr	Sm. Pi	Pica
6x13 Ems Pica.....	449⅓	368⅓	312	230⅓	177	138⅔	112⅓	92	78
4 Ounces.....	196	165	132	100	78	61	51	43	35

Newspaper Measurement.

Table showing the number of ems of the different sizes of newspaper type in a line, the number of lines necessary to make 1,000 ems, and the length in inches. Also the number of ems in the regular lengths of columns:

13 Ems Pica, width of Standard Column.	No. Ems in line.	No. Lines 1,000 Ems.	No. Inch's 1,000 Ems.	4 Col. Folio, or Quarto. No. Ems in Column.	5 Col. Folio, or Quarto. Ems in Col.	6 Col. Folio, or Quarto. Ems in Col.	7 Col. Folio, or Quarto. Ems in Col.	8 Col. Folio, Ems in Col.	9 Col. Folio, Ems in Col.
Agate	28⅓	35⅓	2⅔	5,040	6,505	7,180	7,900	8,630	9,310
Nonpareil	26	38½	3¼	4,325	5,615	6,160	6,785	7,410	8,020
Minion	22¼	45	4⅜	3,175	4,115	4,515	4,970	5,440	5,885
Brevier	19½	51⅓	5⅔	2,465	3,200	3,510	3,865	4,220	4,575
Bourgeois	17⅓	57⅔	7¼	1,950	2,525	2,770	3,050	3,330	3,615
Long Primer	15½	64½	9	1,610	2,085	2,290	2,520	2,755	2,970

Leads for Newspapers.

Table showing the number of leads, 13 ems pica long, contained in one pound, and the number required to lead 1,000 ems of matter; together with the number of leads in a single column of matter, regular sizes of newspapers:

Size of Body Type to be Leaded with 6-to-Pica Leads.	No. Leads to pound.	No. Leads 1,000 Ems.	4 Col. Fol. or Quarto. Leads in Column.	5 Col. Fol. or Quarto. Leads in Column.	6 Col. Fol. or Quarto. Leads in Column.	7 Col. Fol. or Quarto. Leads in Column.	8 Col. Fol. Leads in Column.	9 Col. Fol. Leads in Column.
Agate	60	26	132	170	185	206	224	241
Nonpareil	60	29	125	162	179	197	215	233
Minion	60	34	108	140	154	169	185	201
Brevier	60	40	99	128	141	155	169	183
Bourgeois	60	45	88	114	125	138	150	163
Long Primer	60	52	84	108	119	131	143	154

Book Work Measurement.

Table showing the number of ems to a line, and the number of lines contained in 1,000 ems of matter, standard book measure. Also, the space, in inches, filled by 1,000 ems of matter of the different measures:

Size of Type.	21 Ems Pica.			23 Ems Pica.			25 Ems Pica.		
	No. Ems in Line.	No. Lines 1,000 Ems.	No. Inch's 1,000 Ems.	No. Ems in Line.	No. Lines 1,000 Ems.	No. Inch's 1,000 Ems.	No. Ems in Line.	No. Lines 1,000 Ems.	No. Inch's 1,000 Ems.
Nonpareil	42	24	2	46	21⅔	1¾	50	20	1⅔
Brevier	31½	32¼	3½	35	28⅝	3¼	37½	26½	3
Long Primer	25¼	39½	5½	27⅝	36	5	30	33⅓	4⅝
Small Pica	23	43½	6¾	25	40	6⅛	27¼	36¾	5⅝
Pica	21	48	8	23	43½	7¼	25	40	6⅔

Leads for Book Work.

Number of 4-to-pica and 6-to-pica leads, standard book measures, contained in one pound, and number required to lead 1,000 ems of matter of the standard sizes of book type:

25 EMS	23 EMS.	21 EMS.	The columns of figures on the right give the number of leads required to lead 1,000 ems of matter of the sizes of type named. Those on the left, the number of leads in one pound.		Nonpareil.	Brevier.	Lg. Primer.	Small Pica.	Pica.
No. Leads to Pound.	No. Leads to Pound.	No. Leads to Pound.							
31	34	37	4-to-Pica...	21 Ems P'a long	17	25	33	36	41
				23 " " "	15	23	30	34	37
				25 " " "	13	21	27	32	33
21	23	25	6-to-Pica...	21 " " "	16	23	30	33	39
				23 " " "	14	21	27	31	35
				25 " " "	12	19	25	28	31

Sizes of Newspapers.

TERM.		SIZE.
Five-column	Folio	20 x 26 inches
Six-column	Folio	22 x 31 inches
Six-column	Folio, extra margin	22 x 32 inches
Seven-column	Folio	24 x 35 inches
Seven-column	Folio, extra margin	24 x 36 inches
Eight-column	Folio	26 x 40 inches
Nine-column	Folio	28 x 44 inches
Four-column	Quarto	22 x 31 inches
Five-column	Quarto	26 x 40 inches
Six-column	Quarto	30 x 44 inches
Seven-column	Quarto	35 x 48 inches

Common Sizes of Flat Papers.

NAME.	SIZE.	NAME.	SIZE.
Flat Letter	10 x 16	Medium	18 x 23
Small Cap	13 x 16	Double Small Cap	16 x 26
Flat Cap	14 x 17	Royal	19 x 24
Demy	16 x 21	Double Cap	17 x 28
Folio	17 x 22		

MEASUREMENT BY SQUARE INCHES.

With the following table the printer dispenses entirely with a type measure proper, resorting to the common inch rule. After getting the square inches in his job, he may take the figures directly from the table, or, if the square inches are in excess of the table, add two or more of the numbers together; as, for instance, 79 square inches of brevier, the seventh line gives 567 ems for 7 inches, add a cipher and you have 5,670 ems for 70

inches, and in the ninth line add 729 ems to the 5,670 ems, and you have a total of 6,399 ems in 79 square inches.

NUMBER OF EMS IN SQUARE INCHES.

(Adapted to the Point System.)

	Pica.	Small Pica.	Long Primer	Bourgeois.	Brevier.	Minion.	Nonpareil.
1 square inch.....	36	44	52	64	81	106	144
2 " inches.....	72	88	104	128	162	212	288
3 " "	108	132	156	192	243	318	432
4 " "	144	176	208	256	324	424	576
5 " "	180	220	260	320	405	530	720
6 " "	216	264	312	384	486	636	864
7 " "	252	308	364	448	567	742	1008
8 " "	288	352	416	512	648	848	1152
9 " "	324	396	468	576	729	954	1296
10 " "	360	440	520	640	810	1060	1440
11 " "	396	484	572	704	891	1166	1584
12 " "	432	528	624	768	972	1272	1728
13 " "	468	572	676	832	1053	1378	1872
14 " "	504	616	728	896	1134	1484	2016
15 " "	540	660	780	960	1215	1590	2160
16 " "	576	704	832	1024	1296	1696	2304
17 " "	612	748	884	1088	1377	1802	2442
18 " "	648	792	936	1152	1458	1908	2592
19 " "	684	803	988	1216	1539	2014	2736
20 " "	720	880	1040	1280	1620	2120	2880
21 " " ...	756	924	1092	1344	1701	2226	3024
22 " "	792	968	1144	1408	1782	2332	3168
23 " "	828	1012	1196	1472	1863	2438	3312
24 " "	864	1056	1248	1536	1944	2544	3456
25 " "	900	1100	1300	1600	2025	2650	3600
26 " "	936	1144	1352	1664	2106	2756	3744
27 " "	972	1188	1404	1728	2187	2862	3888
28 " "	1008	1232	1456	1792	2268	2968	4032
29 " "	1044	1276	1508	1856	2349	3074	4176
30 " "	1080	1320	1560	1920	2430	3180	4320
31 " "	1116	1364	1612	1984	2511	3286	4464
32 " "	1152	1408	1664	2048	2592	3392	4608
33 " "	1188	1452	1716	2112	2673	3498	4752
34 " "	1224	1496	1768	2176	2754	3604	4896
35 " "	1260	1540	1820	2240	2835	3710	5040
36 " "	1296	1584	1872	2304	2916	3816	5184
37 " "	1332	1628	1924	2368	2997	3922	5328
38 " "	1368	1672	1976	2432	3078	4028	5472
39 " "	1404	1716	2028	2496	3159	4134	5616
40 " "	1440	1760	2080	2560	3240	4240	5760
41 " "	1476	1804	2132	2624	3321	4346	5904
42 " "	1512	1848	2184	2688	3402	4452	6048
43 " "	1548	1892	2236	2752	3483	4558	6192
44 " "	1584	1936	2288	2816	3564	4664	6336
45 " "	1620	1980	2340	2880	3645	4770	6480
46 " "	1656	2024	2392	2944	3726	4876	6624
47 " "	1692	2068	2444	3008	3807	4982	6768
48 " "	1728	2112	2496	3072	3888	5088	6912
49 " "	1764	2156	2548	3136	3969	5194	7056
50 " "	1800	2200	2600	3200	4050	5300	7200

SIZES OF BOOK AND PRINT PAPERS.

TO FIND WEIGHT OF A GIVEN SIZE TO CORRESPOND WITH BULK OF SAMPLE.

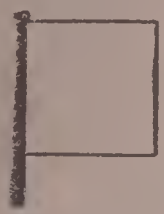
RULE—To find weight required for a given size to correspond in thickness with a given sample, multiply the weight of sample by the dimensions of sheet required, and divide by the product of the dimensions of sample. The table below gives all the regular sizes:

Size and Weight of Sample.		22 x 32.	24 x 36.	25 x 38.	26 x 40.	28 x 42.	30 x 40.	40 x 48.
	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.
22x32—	25	—	31	34	37	42	43	68
	30	—	37	40	44	50	51	82
	35	—	43	47	52	58	60	95
	40	—	49	54	59	67	68	109
24x36—	30	24	—	33	36	41	42	67
	35	29	—	38	42	48	49	78
	40	33	—	44	48	54	56	89
	45	37	—	49	54	61	62	100
	50	41	—	55	60	68	69	111
	60	49	—	66	72	82	83	133
25x38—	35	26	32	—	38	43	44	71
	40	30	36	—	44	50	51	81
	50	37	45	—	55	62	63	101
	60	44	55	—	66	74	76	121
	70	52	64	—	77	87	88	141
	80	59	73	—	88	99	101	162
28x42—	40	24	29	32	35	—	41	65
	45	27	33	36	40	—	46	73
	50	30	37	40	44	—	51	82
	60	36	44	48	53	—	61	98
	70	42	51	57	62	—	71	114
	80	48	59	65	71	—	82	131
	90	54	66	74	80	—	92	147
	100	60	74	82	88	—	102	163
30x40—	40	23	29	32	35	39	—	64
	50	29	36	40	43	49	—	80
	60	35	43	48	52	59	—	96
	70	41	50	55	61	69	—	112
	80	47	58	63	69	78	—	128
	90	53	65	71	78	88	—	144
	100	59	72	79	87	98	—	160

For 32x44 (which is just double 22x32) multiply the figures of 22x32 by 2. Likewise 38x50 is double 25x38, etc. For odd sizes proceed as per rule above.

WIND AND WEATHER SIGNALS.

On March 1, 1887, a new system of weather signals was introduced by the United States Signal Office of the War Department, and has since been in use at all the stations of the service. The flags adopted for this purpose are four in number, and of the form and dimensions indicated below:

No. 1. White Flag.	*No. 2. Blue Flag.*	*No. 3. Black Triangular Flag.*	*No. 4. White Flag with black square in center.*
			
Clear or fair weather.	*Rain or snow.*	*Temperature signal.*	*Cold wave.*

Number 1, white flag, six feet square, indicates clear or fair weather. Number 2, blue flag, six feet square, indicates rain or snow. Number 3, black triangular flag, four feet at the base and six feet in length, always refers to temperature; when placed above numbers 1 or 2 it indicates warmer weather; when placed below numbers 1 or 2 it indicates colder weather; when not displayed, the indications are that the temperature will remain stationary, or that the change in temperature will not vary five degrees from the temperature of the same hour of the preceding day. Number 4, white flag, six feet square, with black square in center, indicates the approach of a sudden and decided fall in temperature. This signal is usually ordered at least twenty-four hours in advance of the cold wave. It is not displayed unless a temperature of forty-five degrees, or lower, is expected. When number 4 is displayed, number 3 is always omitted.

When displayed on poles, the signals are arranged to read downward; when displayed from horizontal supports, a small streamer is attached to indicate the point from which the signals are to be read.

Example.

Cold wave, followed by rain or snow, succeeded by fair weather; colder.

Example.

Warmer, fair weather, followed by rain or snow.

Interpretation of Displays.

No. 1, alone, indicates fair weather, stationary temperature.

No. 2, alone, indicates rain or snow, stationary temperature.

No. 1, with No. 3 below it, indicates fair weather, colder.

No. 2, with No. 3 above it, indicates warmer weather, rain or snow.

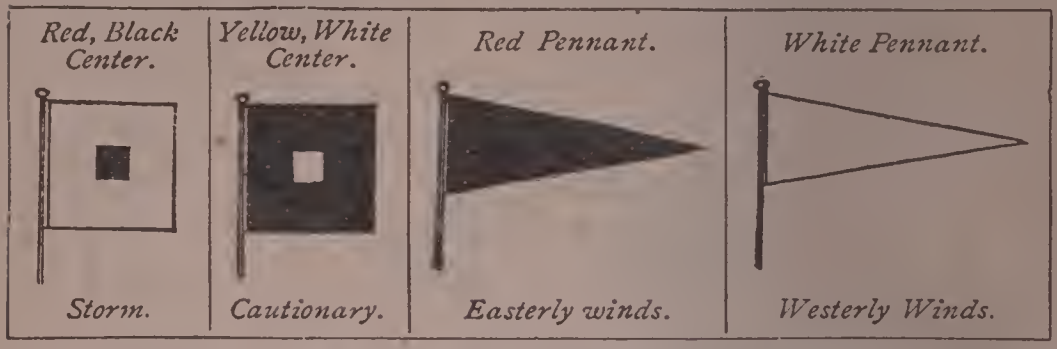
No. 1, with No. 4 below it, indicates fair weather, cold wave.

No. 3, with Nos. 1 and 2 below it, indicates warmer, fair weather, followed by rain or snow.

Storm, Cautionary and Wind-Direction Signals.

A red flag with a black center indicates that the storm is expected to be of marked violence. A yellow flag with a white center indicates that the winds expected will not be so severe, but well-found; seaworthy vessels can meet them without danger. The red pennant indicates easterly winds; that is, from the northeast to *south* inclusive, and that generally the storm center is approaching. If

above cautionary or storm-signal, winds from northeast quadrant are more probable; *below*, winds from southeast quadrant. The white pennant indicates westerly winds; that is, from *north* to southwest inclusive, and that generally the storm center has passed. If *above* cautionary or storm-signal, winds from northeast quadrant are more probable; if *below*, winds from southwest quadrant.



Time Difference Between the City of New York and the Principal Foreign Cities.

	H.	M.	FASTER THAN N. Y.	H.	M.		H.	M.	SLOWER THAN N. Y.	H.	M.
Antwerp	5	13	Dublin	4	31	Melbourne	9	14	Canton	11	31
Berlin	5	50	Edinburgh	4	43	Paris	5	02	Havana		33
Bremen	5	31	Geneva	5	21	Rio de Janeiro	2	03	Hong Kong	11	27
Brussels	5	14	Hamburg	5	36	Rome	5	46	Mexico, City of	1	40
Buenos Ayres	1	02	Liverpool	4	44	St. Petersburg	6	57	Panama		12
Calcutta	10	50	London	4	56	Valparaiso		10	Vera Cruz	1	29
Constantinople	6	53	Madrid	4	42	Vienna	6	01	Yokohama	10	45

Actual New York mean time is given.

The Climates of the United States.

Mean annual temperature, Fahrenheit, at places named.

Alabama	Mobile	66°	Mississippi	Jackson	64°
Alaska	Sitka	46	Missouri	St. Louis	55
Arizona	Tucson	69	Montana	Helena	43
Arkansas	Little Rock	63	Nebraska	Omaha	49
California	San Francisco	55	Nevada	C'p Winfi'ld Scott	50
Colorado	Denver	48	New Hampshire	Concord	46
Connecticut	Hartford	50	New Jersey	Trenton	53
Dakota	Fort Randall	47	New Mexico	Santa Fe	51
Delaware	Willmington	53	New York	Albany	48
Dist. Columbia	Washington	55	North Carolina	Raleigh	59
Florida	Jacksonville	69	Ohio	Columbus	53
Georgia	Atlanta	58	Oregon	Portland	53
Idaho	Fort Boise	52	Pennsylvania	Harrisburg	54
Illinois	Springfield	50	Rhode Island	Providence	48
Indiana	Indianapolis	51	South Carolina	Columbia	62
Indian Territory	Fort Gibson	60	Tennessee	Nashville	58
Iowa	Des Moines	49	Texas	Austin	67
Kansas	Leavenworth	51	Utah	Salt Lake City	52
Kentucky	Louisville	56	Vermont	Montpelier	43
Louisiana	New Orleans	69	Virginia	Richmond	57
Maine	Augusta	45	Washington T	Steilacoom	51
Maryland	Baltimore	54	West Virginia	Romney	52
Massachusetts	Boston	48	Wisconsin	Madison	45
Michigan	Detroit	47	Wyoming	Fort Bridger	41
Minnesota	St. Paul	42			

THE WONDERS OF ELECTRICITY.

THE TELEPHONE.—The principle of the telephone, that sounds could be conveyed to a distance by a distended wire, was demonstrated by Robert Hook in 1667, but no practical application was made of the discovery until 1821, when Professor Wheatstone exhibited his "Enchanted Lyre," in which the sounds of a music box were conveyed from a cellar to upper rooms. The first true discoverer of the speaking telephone, however, was Johann Philipp Reis, a German scientist and professor in the institute of Friedrichsdorf. April 25, 1861, Reis exhibited his telephone at Frankfort. This contained all the essential features of the modern telephone, but as its commercial value was not at all comprehended, little attention was paid to it. Reis, after trying in vain to arouse the interest of scientists in his discovery, died in 1874, without having reaped any advantage from it, and there is no doubt that his death was hastened by the distress of mind caused by his continual rebuffs. Meanwhile, the idea was being worked into more practical shape by other persons, Professor Elisha Gray and Professor A.G. Bell, and later by Mr. Edison. There is little doubt that Professor Gray's successful experiments considerably antedated those of the others, but Professor Bell was the first to perfect his patent. February 12, 1877, Bell's articulating telephone was tested by experiments at Boston and Salem, Mass., and was found to convey sounds distinctly from one place to the other, a distance of eighteen miles. This telephone was exhibited widely in this country and in Europe during that year, and telephone companies were established to bring it into general use. Edison's carbon "loud-speaking" telephone was brought out in 1878. It is not worth while to go into details on the subject of priority of invention. The Examiner of Patents at Washington, July 21, 1883, decided that Professor Bell was the first inventor, because he was the first to complete his invention and secure a full patent. Since 1878 there have been many improvements in the different parts of the telephone, rendering it now nearly perfect in its working.

THE PHONOGRAPH.—The principle of the phonograph is very simple. All sound is produced by vibrations of the air. Therefore, any sound whatever can be reproduced by reproducing its vibrations. The phonograph is regarded as one of the wonders of the nineteenth century, and yet its foundation principle is as readily understood as the multiplication table, and its construction is simplicity itself. A small brass cylinder is made to turn on a metal shaft, and upon its surface is cut a spiral groove, corresponding to threads cut on the shaft. Over the cylinder is spread a sheet of tin foil, secured on its edges by some highly adhering substance. A crank attached to the shaft turns the cylinder, giving it at the same time a rotary and a horizontal motion. In front of the cylinder is a mouthpiece, having on its bottom (next the cylinder) a very thin plate or diaphragm of metal, to which is attached a round steel point. Before using the apparatus the steel point must be accurately adjusted opposite to that part of the foil lying over the spiral groove. If the lips are now applied to the mouthpiece and any sentence spoken, the crank at the same time being turned, the vibrations imparted to the metal plate by the voice will cause the steel point to come into contact with that part of the foil overlying the groove and to make on it a series of indentations as it revolves and is carried forward laterally before the mouthpiece. These indentations vary in depth and sectional outline according to the force and kind of vibrations made, and are in fact a transcription of the sounds. They are then translated by bringing the cylinder back to its starting-point and substituting for the mouthpiece a resonator. The steel is then held by a screw close to the foil, and as the cylinder moves the point retraces the indentations from beginning to end and communicates to the metal diaphragm the same vibrations which it had received from it, and these vibrations, communicated to the resonating apparatus, are reproduced as spoken words. If the crank is turned with exact regularity the exact pitch and tone of the speaker's voice will also be given back. The phonograph was invented by Mr. Edison in 1877 and brought before the public early in the following year. The inventor believed that the numerous practical applications of this machine would commend it very largely to general use. This has not thus far proved to be the case, not because the instrument itself is lacking, for added experiment only proves its more remarkable possibilities, but probably because the invention is so wholly new and strange, so at variance with anything previously known and understood, that men have not yet been able to comprehend its application to everyday affairs.

THE GRAPHOPHONE.—This invention is the work of Mr. Sumner Taintor, aided by Professor Bell, the telephone inventor. The machine is operated on the principle of the phonograph. It is very simple and is free from mechanical complication. It has a treadle, and it looks very much like a small sewing-machine. Edison discovered the art of recording and reproducing sound, but his invention could not be used because of its clumsy mechanical arrangement, coupled with the very inferior and unsatisfactory methods of recording the sounds produced. He used a piece of tinfoil upon which the sound waves were indented and from which they were easily obliterated. The present inventor, Mr. Taintor, saw that a less destructible material was required, and after considerable experiment tried a preparation of wax and paraffine. This is the surface now used, and it works perfectly. He then made an entirely new apparatus, and the result is the graphophone, a machine which will sing a song, report a whistle, or give the quality and inflections of the voice in a most charming way. The small point which is attached to the diaphragm of the machine cuts a minute hair line in the wax surface. This line is so faint that it is scarcely perceptible to the naked eye, yet it serves to give a reproduction, so as to be distinctly heard by the listener, of a song, a laugh, or an ordinary speech.

THE ELECTRIC RAILWAY.—Electricity may be applied to the propulsion of cars in two different ways. In one case the current is supplied to the electro-motors from storage batteries carried by the cars. This method requires no change in the ordinary roadbed used by the steam railway, but no means have yet been invented for making or operating economically the storage battery required. In the second case the current is supplied to the motors on moving trains from stations along the line of road through properly placed conductors. The method requires a peculiar construction of the road throughout with reference to the necessary electrical conditions. Several different forms of the electric railway are possible, depending on the method by which the current is conducted to the motors. By one method the two rails are used as conductors, the current going out by one rail and returning by the other, and passing to the electro-motors through the wheels of the train, which are insulated. There is much leakage or loss of power in this method, however, and its inventors have essayed to overcome by using a third rail or conductor for the outgoing current, utilizing both rails for its return. We will briefly describe the method of working the Siemens electric railway, which has been applied successfully to several short railway lines in Europe. The longest of these lines is that between Portrush and Bushmills, in the north of Ireland, which is six miles long. The line is a three-foot gauge, single track, laid at one side of the country road. The third rail, or conductor, is placed beside the roadbed, 17 inches above the ground. It is a T-rail carried upon insulator posts. The current is conveyed by the conductor to the car by means of two steel springs, one at each end. Wherever the railway crosses roads the conductor is carried underground. The current from the conducting rail passes through the car to the return rails by a switch worked by a lever—with which resistance coils can be placed in or out of circuit—then through the electro-motor to the wheels by which it reaches the rails. The motor is placed in the center of the car, beneath the floor, being connected with the axle of one pair of wheels by gearing. The reversing and brake levers are placed at each end of the car, so that it can be operated from either end. The rails of the track are laid in the usual manner, and are connected with the strips of copper to insure good electrical contact. In the Edison and Field railway, which was exhibited at the Chicago Exhibition of Railway Appliances, the same general plan was observed. but the conductor was placed between the two other rails, and the current was conveyed from this rail to the car through stiff wire brushes pressing on each side of the rail. These were operated by a lever reaching down from the car. This track was 1,553 feet in length.

THE ELECTRIC LIGHT.—Setting aside natural phenomena, as the lightning and St. Elmo's fire, and all mere experiments with the electric spark, the first inventor of the electric light was Sir Humphrey Davy, who in the early part of the century produced the arc light with a battery of 2,000 cells. The mode of producing this light is as follows: When the terminal wires of an electric battery

are brought together and then separated slightly an intense, bright light between them results, and this, because of its curved form, is called the electric arc. This light, in temperature as well as brightness, exceeds all other artificial sources of heat, by its means the hardest substances, even the diamond, being entirely consumed. The wires of the battery in this light melt and drop off in globules, but it was found that hard carbon points on the wires would prevent this, as well as increase the intensity of the light. Davy used pieces of charcoal. Foucault, in his experiments in 1844, used carbon from the retorts of gas-works, which is much harder. Foucault's improvement led to the first practical use of the electric light. It was used to illuminate the Place de la Concorde, in Paris, being placed on the knee of one of the statues there, and amazing all beholders with its brilliant power. The carbon points, though not destroyed as rapidly as wire, yet of course must waste in the consuming heat of the light. In time the distance between them is increased until the light is interrupted, and they must be brought together again to renew the illumination. Thomas Wright, of London, invented the first apparatus for moving the points automatically toward each other, a feature which now belongs to several forms of electric lighting As it has been found that the positive carbon wastes more rapidly than the negative, that point is made to move over a wider space than the other in the same interval of time.

In 1855 Jules Duboscq's electric lamp—thus far the most perfect of the kind—was shown at the Paris Exhibition, and Professor Tyndall, of England, adopted it for the illustration of his lectures on light and colors In 1858 the works of the new Westminster bridge, London, were illuminated by Watson's electric light, and the following year the magneto-electric light, invented by Professor Holmes, was successfully tried at the lighthouse at Dover. In 1861 the French Government provided for the illumination of eight coast light-houses by the electric light. But, though improvements were made in the invention during the fifteen years following, little was accomplished toward practical electric lighting until the invention of Jablochkoff's candle. Paul Jablochkoff was a Russian, who for his scientific knowledge and skill had been appointed director of telegraph lines between Moscow and Kursk. He resigned this post in 1875, desiring to devote his time wholly to scientific study. He intended to visit the Centennial Exhibition in this country in 1876. but on his way hither stopped in Paris, where a noted chemist induced him to remain by placing a large laboratory at his disposal. Here a few months later he produced the electric candle, whose discovery made a great sensation. This consisted of two carbons placed side by side, separated and encased in an insulating and fusible substance. As the carbons wasted the fusible substance was also consumed. The light given by this candle was soft and steady, and a large number of them speedily came into use in Europe. It was quite overshadowed in importance, however, by the incandescent lamp, which was first invented about 1870. The different kinds of electric lights now in use may be divided into five groups, thus: 1. Glow lamps or incandescent lamps, in which the light is produced by a bad conductor in an uninterrupted circuit, the conductor itself being not directly consumed. 2. Mixed or semi-incandescent lamps, in which the light is produced at the place of contact between two conductors, one of them being consumed more or less rapidly. 3. Regulated lamps, in which the light is formed by the voltaic arc, and the distance of the carbons is continually regulated by clockwork or other means. 4. Electric candles, having the carbons parallel, as above described. In each of these groups a series of different lamps have been invented, differing somewhat in details of construction. Thus we have, in the incandescent lamps, the Swan lamp, the Maxim lamp, the Edison lamp, the Siemens lamp, and others. We may briefly describe the Edison as a type of the class. In this bamboo fiber is used for the carbon filament, and this is attached to platinum wire. By means of machinery the bamboo is divided into small fibers, and pressed in U-shaped moulds, then put into ovens, where they are allowed to become carbonized. They are then attached to the plantinum wire and fused in a glass stopper. A glass tube is now blown into a bulb, the stopper is placed in it, and both bulb and stopper are fused together. The bulb is then exhausted of its air—for the electric light requires a vacuum for its brilliancy—and the opening at its apex is closed by fusing. The platinum wires of the lamp are connected with the copper wires from a battery, and the lamp is ready for use. A very simple contrivance for breaking the current by turning a

key serves to ignite or extinguish the lamps. Each lamp is guaranteed to burn 800 hours; after about that period both the platinum and the carbon are exhausted by slow combustion, and a new lamp must be fitted on. The principal difference between the incandescent lamps is in the preparation of the carbon filament. Those for the Swan lamp are made from cotton fibers soaked in sulphuric acid, then packed in fine coal-dust, and exposed to heat. The Maxim lamp filaments are prepared from Bristol paper; those of the Lane-Fox lamp from hemp and coke; those of the Bernstein lamp—one of the most brilliant made—are of silk carbonized in coal-dust. The half-incandescent lamps are quite a recent invention, the first being made in 1878. In these the light arises at the point of contact, and the essential features of the plan consist of a pencil of carbon pressed against a carbon block; as its point is consumed the pencil is pushed forward, thus rendering the light continuous. Some eight or nine different lamps have been invented on this plan. The regulated arc lamps include an even larger number of patents, of which the best known in this country is the Brush light. The lights in all these are formed between the points of the carbon rods, and the details of clockwork for moving forward the rods as they are consumed are too technical for description Still another style of electric lamp has the carbons inclined at an angle to each other, and some very successful lamps, as the Soleil, have been made on this plan. It might be here noted that the great impetus given to the electric light by the work of Mr. Edison was not so much in improving the lamp as in cheapening the process of generating the electricity, and inventing a ready mode of dividing the light. Hitherto the expense attendant upon the production of the electric force, and the difficulty of using it simultaneously at a large number of illuminating points, had been the two principal barriers in the way of applying the electric light to public use.

STORAGE OF ELECTRICITY.—It must be noted, to begin with, that the term "storing electricity" conveys, usually, an altogether erroneous idea to the uninitiated. They are apt to conceive of it as pouring electricity into some receptacle, as we pour oil into a lamp, to be used when needed. But, in fact, electricity is an energy, not a substance, and therefore is not capable of storage, in the ordinary sense. What is really done by the "storage" apparatus is to convert electricity into chemical energy, under such circumstances that, by proper arrangements, it may be readily converted back into electricity. The secondary batteries used for the storing purpose are more correctly termed accumulators. The first battery of this kind was made by Ritter about 1840, and it consisted of a series of disks of a single metal, alternated with cloth or card moistened in a liquid by which the metal would not be affected chemically. In 1859 Mr. Gaston Plante made a secondary battery, for which he used plates of lead, instead of plates of platinum. Passing a current through these, lead oxide was deposited, and after the charging current was removed, the lead and lead oxide were found to yield a very slight current. To increase this Plante devised the plan of first charging the plates, then discharging, then charging again with the battery current reversed, and so on, until, by repeated oxidations and subsequent reductions of the oxidized material, very porous plates were made. These, by their porosity, exposed a large surface to the oxidizing action of the current, so that a small porous plate took up as much electricity as one of large superficial area. Plante found that by connecting a number of cells together, and after charging them, arranging them in series, that is, the positive plate of one connected with the negative plate of another, and so on, he could store for use quite powerful currents of electricity. In 1880 another electrician, M. Camille Faure, devised the plan of coating Plante's lead plates with red lead, and then encasing them in flannel. The advantage of the red lead is that it is very quickly made porous, and therefore the process of repeated charging of the plates, known as the "forming" process, was reduced from weeks to days, and even to hours. This discovery, by reducing the time and expense of making the secondary battery, gave it a commercial value that it never had before, and it was hailed as a great advantage. Since that time a number of patents have been obtained for storage batteries, and they now exist in different forms, but generally modeled on the inventions of Plante and Faure. The efforts of inventors have been mainly directed toward reducing the weight of the cells and to devising new ways of holding the red lead on the plates. This last-named substance, becoming porous, drops off readily, and for

this reason the encasements of flannel, etc., were first devised. In some of the storage batteries, a plate, or frame, of cast lead is used, with receptacles, cells, etc., which are filled with the red lead.

ELECTRICAL TERMS.—The technical terms used in regard to electricity refer to units of various nature. Thus the unit of capacity is one farad; the unit of activity, one watt; the unit of work one joule; the unit of quantity, one coulomb; the unit of current, one ampere; the unit of resistance, one ohm; the unit of magnetic field, one gauss; the unit of pressure, one volt; the unit of force, one dyne. The names are mostly derived from the names of men that have been famous in the field of electrical research. Thus Michael Faraday, James Watt and James P. Joule, famous English discoverers, give their names to the first three units mentioned; Charles A. Coulomb and Andre M. Ampere, French inventors, to the two units following; G. S. Ohm and Carl F. Gauss, Germans, name two more units; and the volt is named from the Italian discoverer, Volta. The dyne is derived from the root word of dynamo, itself meaning force.

PRESERVING WOOD.—There have been a number of processes patented for preserving wood. One of them, very generally used, consists in immersing the timber in a bath of corrosive sublimate. Another process consists in first filling the pores with a solution of chloride of calcium under pressure, and next forcing in a solution of sulphate of iron, by which an insoluble sulphate of lime is formed in the body of the wood, which is thus rendered nearly as hard as stone. Wood prepared in this way is now very largely used for railroad ties. Another process consists in impregnating the wood with a solution of chloride of zinc. Yet another way is to thoroughly impregnate the timber with oil of tar containing creasote and a crude solution of acetate of iron. The process consists in putting the wood in a cylindrical vessel, connected with a powerful air pump. The air is withdrawn, and the liquid subjected to pressure, so that as much of it as possible is forced into the pores of the wood. The processes above given not only season the timber so that it is not subject to dry rot, but also keep it from being injured by the weather, or being attacked by insects or worms.

TO MAKE CLOTH WATERPROOF.—There have been various devices for rendering cloth waterproof without the use of India rubber. The most successful of these, no doubt, is the Stenhouse patent. This consists of the application of paraffine combined with drying oil. Paraffine was first used alone, but it was found to harden and break off from the cloth after a time. When drying oil was added, however, even in a very small quantity, it was found that the two substances, by the absorption of oxygen, became converted into a tenacious substance very like resin. To apply this the paraffine is melted with drying oil, and then cast into blocks. The composition can then be applied to fabrics by rubbing them over with a block of it, either cold or gently warmed. Or the melted mixture may be applied with a brush and the cloth then passed through hot rollers in order to cover its entire substance perfectly. This application makes cloth very repellant to water, though still pervious to air.

THE RULE OF THE ROAD.—The "rule of the road" in the United states is "turn to the right;" in England it is the reverse. The rule holds in this country in the case where two vehicles going in opposite directions meet. When one vehicle overtakes another the foremost gives way to the left and the other passes by on the "off side;" and when a vehicle is crossing the direction of another it keeps to the left and crosses in its rear. These two rules are the same in this country and in England, and why the rule concerning meeting vehicles should have been changed it is impossible to say. We find this point of difference noted by all authorities, but no reason for it is ever suggested. Probably, as it is easier to turn to the right than to the left, it was adopted as the more preferable custom in some of the early colonies, and in due time became embodied in local law, and thus was handed down to later times.

PIANO POLISH.—Take equal proportions of turpentine, linseed oil and vinegar. Mix; rub in well with a piece of flannel cloth. Then polish with a piece of chamois skin. This treatment will entirely remove the dingy appearance that age gives to fine woods.

The Standard Silver Dollar.

The coinage of the standard silver dollar was first authorized by Act of April 2, 1792. Its weight was to be 416 grains standard silver; fineness, 892.4; which was equivalent to 371¼ grains of fine silver, with 44¾ grains of pure copper alloy. This weight was changed by act of January 18, 1837, to 412½ grains, and fineness changed to 900, thus preserving the same amount of pure silver as before. By act of February 12, 1873, the coinage was discontinued. The total number of silver dollars coined from 1792 to 1873 was 8,045,838. The act of 1873 provided for the coinage of the "trade dollar," of weight 420 grains, and an act passed in June, 1874, ordered that all silver coins should only be "legal tender at their nominal value for amounts not exceeding $5." The effect of these acts was the "demonetization" of silver, of which so much has been said. Feb. 28, 1878, the coinage of the standard dollar of 412½ grains was revived by act of Congress; $2,000,000 per month was ordered coined, and the coins were made legal tender for all debts, public and private. From February, 1878, to Nov. 1, 1885, 213,257,594 of these standard dollars were coined under the above act.

Standard Time.

What is known as the "new standard time" was adopted by agreement by all the principal railroads of the United States at 12 o'clock, noon, on Nov. 18, 1883. The system divides the continent into five longitudinal belts, and fixes a meridian of time for each belt. These meridians are fifteen degrees of longitude, corresponding to one hour of time, apart. Eastern Maine, New Brunswick and Nova Scotia use the the 60th meridian; the Canadas, New England, the Middle States, Virginia and the Carolinas use the 75th meridian, which is that of Philadelphia; the States of the Mississippi Valley, Alabama, Georgia and Florida, and westward, including Texas, Kansas, and the larger part of Nebraska and Dakota, use the 90th meridian, which is that of New Orleans. The Territories to the western border of Arizona and Montana go by the time of the 105th meridian, which is that of Denver; and the Pacific States employ the 120th meridian. The time divisions are known as intercolonial time, eastern time, central time, mountain time and Pacific time. A traveler passing from one time belt to another will find his watch an hour too fast or too slow, according to the direction in which he is going. All points in any time division using the time of the meridian must set their time-pieces faster or slower than the time indicated by the sun, according as their position is east or west of the line. This change of system reduced the time standards used by the railroads from fifty-three to five, a great convenience to the railroads and the traveling public. The suggestion leading to the adoption of this new system originated with Professor Abbe, of the Signal Bureau at Washington.

Theosophy.

Much is said nowadays about theosophy, which is really but another name for mysticism. It is not a philosophy, for it will have nothing to do with pholosophical methods: it might be called a religion, though it has never had a following large enough to make a very strong impression on the world's religious history. The name is from the Greek word theosophia—divine wisdom—and the object of theosophical study is professedly to understand the nature of divine things. It differs, however, from both philosophy and theology even when these have the same object of investigation. For, in seeking to learn the divine nature and attributes, philosophy employs the methods and principles of natural reasoning; theology uses these, adding to them certain principles derived from revelation. Theosophy, on the other hand, professes to exclude all reasoning processes as imperfect, and to derive its knowledge from direct communication with God himself. It does not, therefore, accept the truths of recorded revelation as immutable, but as subject to modification by later direct and personal revelations. The theosophical idea has had followers from the earliest times. Since the Christian era we may class among theosophists such sects as Neo-Platonists, the Hesychasts of the Greek Church, the Mystics of mediæval times, and, in later times, the disciples of Paracelsus, Thalhauser, Bohme, Swedenborg, and others. Recently a small sect has arisen, which has taken the name of Theosophists. Its leader was an English gentleman who had become fascinated with the doctrine of Buddhism. Taking a few of his followers to India, they have been prosecuting their studies there, certain individuals attracting considerable attention by a claim to miraculous powers. It need hardly be said that the revelations they have claimed to receive have been, thus far, without element of benefit to the human race.

The Evolution Theory.

The evolution or development theory declares the universe as it now exists to be the result of a long series of changes, which were so far related to each other as to form a series of growths analogous to the evolving of the parts of a growing organism. Herbert Spencer defines evolution as a progress from the homogeneous to the heterogeneous, from general to special, from the simple to the complex elements of life, and it is believed that this process can be traced in the formation of worlds in space, in the multiplication of types and species among animals and plants, in the origin and changes of languages and literature and the arts, and also in all the changes of human institutions and society. Asserting the general fact of progress in nature, the evolution theory shows that the method of this progress has been (1) by the multiplication of organs and functions; (2) ac-

cording to a defined unity of plan, although with (3) the intervention of transitional forms, and (4) with modifications dependent upon surrounding conditions. Ancient writers occasionally seemed to have a glimmering knowledge of the fact of progress in nature, but as a theory "evolution" belongs to the enlightenment of the nineteenth century. Leibnitz, in the latter part of the seventeenth century, first uttered the opinion that the earth was once in a fluid condition, and Kant, about the middle of the eighteenth century, definitely propounded the nebular hypothesis, which was enlarged as a theory by the Herschels. The first writer to suggest the transmutation of species among animals was Buffon, about 1750, and other writers followed out the idea. The eccentric Lord Monboddo was the first to suggest the possible descent of man from the ape, about 1774. In 1813 Dr. W. C. Wells first proposed to apply the principle of natural selection to the natural history of man, and in 1822 Professor Herbert first asserted the probable transmutation of species of plants. In 1844 a book appeared called "Vestiges of Creation," which, though evidently not written by a scientific student, yet attracted great attention by its bold and ingenious theories. The authorship of this book was never revealed until after the death of Robert Chambers, a few years since, it became known that this publisher, whom no one would ever have suspected of holding such hetorodox theories, had actually written it. But the two great apostles of the evolution theory were Charles Darwin and Herbert Spencer. The latter began his great work, the "First Principles of Philosophy," showing the application of evolution in the facts of life, in 1852. In 1859 appeared Darwin's "Origin of Species." The hypothesis of the latter was that different species originated in spontaneous variation, and the survival of the fittest through natural selection and the struggle for existence. This theory was further elaborated and applied by Spencer, Darwin, Huxley, and other writers in Europe and America, and though to-day by no means all the ideas upheld by these early advocates of the theory are still accepted, evolution as a principle is now acknowledged by nearly all scientists. It is taken to be an established fact in nature, a valid induction from man's knowledge of natural order.

The Mind Cure.

The mind cure, otherwise known in its various subdivisions as metaphysics, Christian science, mental science, etc., is a species of delusion quite popular at the present time. Every era of the world has cherished similar delusions, for the mass of the human race, even in what are considered the educated classes, are so unfamiliar with the processes of exact reasoning that they fall a

ready prey to quacks of all kinds. The fundamental idea of the mind cure system is that there is no such thing as sickness. Disease, says one of their apostles, is an error of the mind, the result of fear. Fear is only faith inverted and perverted. God, who is all good Himself, and who made everything good, cannot have been the author of any disease. As disease, therefore, is not a creation, it has no existence, and when the healer has succeeded in impressing this fact upon the mind of the patient, the cure is effected. It is curious to note into what utter absurdities the need for consistency carries these apostles. Poisons, they say, would be quite harmless if the fear of them was removed, but we have yet to find the "mental science" teacher who will undertake to prove this by herself taking liberal doses of aconite and strychnine. The illnesses of children are explained by the hypothesis of hereditary fear. The majority of the teachers of this new faith are women, many of whom, no doubt, are sincere in their belief; but it may be safely stated that the men engaged as the so-called physicians of the new practice are, with few exceptions, unprincipled quacks, who have gone into the business for the money they can make by duping the ignorant. As far as there is any truth underlying the vagaries of mind cures, and their boasts of remarkable cases of healing, it may be admitted that the mind has much influence over the body. This fact has been recognized by intelligent physicians for centuries. And that the peculiar modern type of nervous diseases, which are so largely caused by excessive stimulus of the nerves and the imagination, should be amenable to cure through the imagination, is not strange. It will be noted that this mental cure has effected its miracles mainly among women, where it has the emotional temperament to work on, and almost wholly in the ranks of the wealthy and well-to-do, where there is little or no impoverishment of the system by insufficient food and excessive toil to hinder its effects. We have not heard, nor are we likely to hear, of an epidemic disease checked by the mind cure, or of the healing of acute affections or organic troubles through its agency. Nor do we hear of its seeking to carry its message of healing into the houses of the suffering poor in large cities, where hunger, exposure and foul airs open wide the door to fevers and all deadly diseases, nor yet into hospitals for contagious or incurable affections. In the presence of such realities it would prove, as its votaries probably understand, a too-painful mockery. Intelligently analyzed, therefore, this new revelation amounts to nothing more than a quite striking proof of the remarkable influence of the mind over the nervous system. Beyond this, the craze, in attempting to disprove the existence of disease, and to show that poisons do not kill, is simply running against the plain and inevitable facts of life, and can safely be left to perish through its own rashness.

GEMS OF POETRY.

There is a tide in the affairs of men
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows and in miseries.—*Shakespeare.*

Therefore, since brevity is the soul of wit,
And tediousness the limbs and outward flourishes—
I will be brief.—*Shakespeare.*

The quality of mercy is not strain'd;
It droppeth, as the gentle rain from heaven,
Upon the place beneath.—*Shakespeare.*

What are monuments of bravery
Where no public virtues bloom?
What avail, in lands of slavery,
Trophied temples, arch and tomb?—*Campbell.*

Virtue alone outbuilds the pyramids;
Her monuments shall last when Egypt's fall.—*Young.*

Not to him who rashly dares.
But to him who nobly bears,
Is the victor's garland sure.—*Whittier.*

A trinity there seems of principles,
Which represent and rule created life—
The love of self, our fellows, and our God.—*Bailey.*

Hark, his hands the lyre explore!
Bright-eyed Fancy, hovering o'er,
Scatters from her pictur'd urn
Thoughts that breathe and words that burn.—*Gray.*

I hold it truth with him who sings
To one clear harp in divers tones,
That men may rise on stepping-stones
Of their dead selves to higher things.—*Tennyson.*

Think'st thou existence doth depend on time?
It doth; but actions are our epochs.—*Byron.*

Man but dives in death;
Dives from the sun in fairer day to rise.
The grave his subterranean road to bliss.—*Young.*

There is no death! What seems so is transition;
This life of mortal breath
Is but a suburb of the life Elysian,
Whose portal we call death.—*Longfellow.*

Know, then, thyself; presume not God to scan;
The proper study of mankind is man.—*Pope.*

Lowliness is young ambition's ladder,
Whereto the climber upward turns his face;
But when he once attains the utmost round,
He then unto the ladder turns his back,
Looks in the clouds, scorning the base degrees
By which he did ascend.—*Shakespeare.*

Condition, circumstance, is not the thing;
Bliss is the same in subject or in king.—*Pope.*

Men who their duties know,
But know their rights, and, knowing,
Dare maintain.—*Jones.*

Oh, fear not in a world like this,
And thou shalt know ere long,
Know how sublime a thing it is
To suffer and be strong.—*Longfellow.*

The Arve and Arveiron at thy base
Rave ceaselessly; but thou, most awful Form!
Risest from forth thy silent sea of pines,
How silently! Around thee and above
Deep is the air, and dark, substantial black,
An ebon mass; methinks thou piercest it
As with a wedge.—*Coleridge* (On Mt. Blanc).

Let fate do her worst, there are moments of joy,
Bright dreams of the past, which she cannot destroy;
Which come in the night time of sorrow and care,
And bring back the features that joy used to wear.—*Moore.*

Delightful task! to rear the tender thought,
To teach the young idea how to shoot,
To pour the fresh instruction o'er the mind,
To breathe th' enliv'ning spirit, and to fix
The generous purpose in the glowing breast.—*Thomson.*

Every inordinate cup
Is unblessed, and the ingredient is a devil.—*Shakespeare.*

And I will trust that He who heeds
The life that hides in mead and wold,
Who hangs yon alder's crimson beads,
And stains these mosses green and gold,
Will still, as HE hath done, incline
His gracious care to me and mine.—*Whittier.*

Yet I doubt not through the ages
One increasing purpose runs,
And the thoughts of men are widened
With the process of the suns.—*Tennyson.*

Oh, that men should put an enemy in
Their mouths to steal away their brains!—*Shakespeare.*

'Tis strange, but true, for truth is always strange,
Stranger than fiction.—*Byron.*

Still to ourselves in every place consigned,
Our own felicity we make or find.—*Goldsmith.*

Shall man alone, for whom all else revives,
No resurrection know?—*Young.*

To gild refined gold, to paint the lily,
To throw a perfume on the violet,
To smooth the ice or add another hue
Unto the rainbow, or with taper light
To seek the beauteous eye of heaven to garnish,
Is wasteful and ridiculous excess.—*Shakespeare.*

The purest treasure mortal times afford
Is spotless reputation; that away,
Men are but gilded loam or painted clay.—*Shakespeare.*

Our little lives are kept in equipoise
By opposite attractions and desires;
The struggle of the instinct that enjoys,
And the more noble instinct that aspires.—*Longfellow.*

Oh! many a shaft at random sent
Finds mark the archer little meant,
And many a word at random spoken
May soothe or wound a heart that's broken.—*Scott.*

A weapon that comes down as still
As snowflakes fall upon the sod,
But executes a freeman's will
As lightning does the will of God;
And from its force nor doors nor locks
Can shield you; 'tis the ballot-box.—*Pierpont.*

Happy the man who sees a God employed
In all the good and ill that checker life!—*Cowper.*

'Tis greatly wise to talk with our past hours,
And ask them what report they bore to heaven.—*Young.*

Kind hearts are more than coronets,
And simple faith than Norman blood.—*Tennyson.*

'Tis distance lends enchantment to the view,
And clothes the mountain in its azure hue.—*Campbell.*

Good name, in man and woman, dear my lord,
Is the immediate jewel of their souls.—*Shakespeare.*

Who, then, to frail mortality shall trust,
But limns the water, or but writes in dust.—*Lord Bacon.*

My mind to me a kingdom is;
Such present joys therein I find
That it excels all other bliss
That earth affords or grows by kind;
Though much I want which most would have,
Yet still my mind forbids to crave.—*Dyer.*

But words are things, and a small drop of ink,
Falling, like dew, upon a thought, produces
That which makes thousands, perhaps millions, think.
—*Byron.*

His golden locks hath Time to silver turned,
O time too swift! O swiftness never ceasing!
His youth 'gainst time and age hath ever spurned,
But spurned in vain; youth waneth by increasing.
Beauty, strength, youth, are flowers but fading seen,
Duty, faith, love, are roots, and ever green.—*Lord Bacon.*

Ill fares the land, to hastening ills a prey,
When wealth accumulates and men decay;
Princes and lords may flourish and may fade,
A breath can make them as a breath has made,
But an honest peasantry, a country's pride,
When once destroyed, can never be supplied.—*Goldsmith.*

An honest man's the noblest work of God.—*Pope.*

'Tis heaven alone that is given away;
'Tis only God may be had for the asking.—*Lowell.*

There is no death! An angel form
Walks o'er the earth with silent tread;
He bears our best lov'd things away,
And then we call them "dead."—*Harvey.*

First, then, a woman will or won't, depend on 't:
If she will do 't, she will; and there's an end on 't.
But if she won't, since safe and sound your trust is,
Fear is affront, and jealousy injustice.—*Hill.*

What stronger breastplate than a heart untainted?
Thrice is he arm'd that hath his quarrel just;
And he but naked, though lock'd up in steel,
Whose conscience with injustice is corrupted.—*Shakespeare.*

So dear to heaven is saintly chastity
That, when a soul is found sincerely so,
A thousand liveried angels lackey her,
Driving far off each thing of sin and guilt.—*Milton.*

Who has not felt how sadly sweet
The dream o. home, the dream of home,
Steals o'er the heart, too soon to fleet,
When far o'er sea or land we roam?—*Moore.*

No peace nor ease the heart can know
Which, like the needle true,
Turns at the touch of joy or woe,
But, turning, trembles too.—*Mrs. Greville.*

Truth crushed to earth shall rise again;
The eternal years of God are hers;
But Error, wounded, writhes with pain,
And dies among his worshipers.—*Byron.*

Rest here, distrest by poverty no more;
Here find that calm thou gav'st so oft before;
Sleep, undisturb'd, within this peaceful shrine,
'Till angels wake thee with a note like thine.—*Johnson.*

Care to our coffin adds a nail, no doubt,
And every grin so merry draws one out.—*Wolcot.*

Shall I, wasting in despair,
Die because a woman's fair?
Or make pale my cheeks with care
'Cause another's rosy are?
Be she fairer than the day,
Or the flow'ry meads in May,
If she be not so to me,
What care I how fair she be?—*Wither.*

The world's a bubble, and the life of man,
Less than a span.—*Bacon.*

Great wit is sure to madness close allied,
And thin partitions do their bounds divide.—*Dryden.*

What a piece of work is man! How noble in reason! how infinite in faculties! in form and moving, how express and admirable! in action, how like an angel! in apprehension, how like a god!—*Shakespeare.*

She walks in beauty, like the night
Of cloudless climes and starry skies;
And all that's best of dark and bright
Meet in her aspect and her eyes;
Thus mellow'd to that tender light
Which Heaven to gaudy day denies.—*Byron.*

If thou faint in the day of adversity, thy strength is small.—*Old Testament.*

In Faith and Hope the world will disagree,
But all mankind's concern is Charity.—*Pope.*

Sweet are the uses of adversity,
Which, like the toad, ugly and venomous,
Wears yet a precious jewel in his head;
And thus our life, exempt from public haunt,
Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in everything.—*Shakespeare.*

Should auld acquaintance be forgot,
And never brought to min'?
Should auld acquaintance be forgot,
And days o' auld lang syne?—*Burns.*

Statesman, yet friend to truth! Of soul sincere,
In action faithful and in honor clear;
Who broke no promise, serv'd no private end;
Who gained no title, and who lost no friend.—*Pope.*

O woman, lovely woman! nature made thee
To temper man; we had been brutes without you.
Angels are painted fair, to look like you;
There's in you all that we believe in heaven:
Amazing brightness, purity and truth,
Eternal joy and everlasting love.—*Otway.*

MISQUOTATIONS.

It is a peculiar faculty of human memory to misquote proverbs and poetry, and almost invariably to place the credit where it does not belong.

Nine men out of ten think that "The Lord tempers the wind to the shorn lamb" is from the Bible, whereas Lawrence Sterne is the author. "Pouring oil upon the troubled waters" is also ascribed to the sacred volume, whereas it is not there; in fact, no one knows its origin.

Again, we hear people say: "The proof of the pudding is in chewing the string." This is arrant nonsense, as the proverb says:

"The proof of the pudding is in the eating thereof, and not in chewing the string."

Nothing is more common than to hear:

A man convinced against his will
Is of the same opinion still.

This is an impossible condition of the mind, for no one can be convinced of an opinion and at the same time hold an opposite one. What Butler wrote was eminently sensible:

He that complies against his will
Is of his own opinion still.

A famous passage of Scripture is often misquoted thus: "He that is without sin among you, let him cast the first stone." It should be: "Let him first cast a stone."

Sometimes we are told: "Behold how great a fire a little matter kindleth," whereas St. James said: "Behold how great a matter a little fire kindleth," which is quite a different thing.

We also hear that a "miss is as good as a mile," which is not as sensible or forcible as the true proverb: "A miss of an inch is as good as a mile."

"Look before you leap" should be: "And look before you ere you leap."

Pope is generally credited with having written:

Immodest words admit of no defense,
For want of decency is want of sense,

though it would puzzle any one to find the verses in his writings. They were written by the Earl of Roscommon, who died before Pope was born.

Franklin said: "Honesty is the best of policy," but the maxim is of Spanish origin, and may be found in "Don Quixote."

POSTAL INFORMATION.

LOCAL, or DROP LETTERS, two cents for each ounce at all letter carrier offices, and at other offices 1 cent.

LETTERS to any part of the United States or the Dominion of Canada, 2 cents for each ounce or fraction thereof.

LETTERS to Great Britain or Ireland, or the Continent of Europe, 5 cents for each half ounce.

VALUABLE LETTERS may be registered by paying a charge of 10 cents.

POSTAL CARDS costing one cent each can be sent to any part of the United States or Canada. They may be sent to Newfoundland, Great Britain and Ireland by adding a 1 cent stamp.

PRINTED MATTER: 1. Printed Books, Periodicals, Transcient Newspapers and other matter wholly in print, in unsealed envelopes, 1 cent for each two ounces or fraction thereof.

2. Printed circulars may bear the date, address and signature at this rate.

3. Reproductions by electric pen, Hekograph, and similar processes, same as Printed Matter.

ARTICLES OF MERCHANDISE, SEEDS, CUTTINGS, ROOTS, and other mailable matter, 1 cent for each ounce or fraction thereof.

ALL PACKAGES of mail matter not charged with letter postage must be arranged so the same can be conveniently examined by postmasters. If not so arranged, letter postage will be charged.

ARTICLES OF MERCHANDISE may be registered at the rate of 10 cents a package, subject to proper examination before registration. The name and the address of sender must be indorsed in writing, or in print, on each package offered for registration.

ANY PACKAGE may have the name and address of the sender, with the word "from" prefixed on the wrapper, and the number and names of the articles may be added in brief form.

POSTAL NOTE, payable to bearer at any money order office designed by the purchaser of the note, must be for an amount under five dollars, and will cost three cents.

MONEY ORDERS: The fee for a money order not exceeding $10 is 8 cents; $10 to $15, 10 cents; $15 to $30, 15 cents; $30 to $40, 20 cents; $40 to $50, 25 cents; $50 to $60, 30 cents; $60 to $70, 35 cents; $70 to $80 dollars, 40 cents; $80 to $100, 45 cents.

THE TARIFF AND RECIPROCITY.

THE CUSTOMS TARIFF ACT OF OCTOBER 1, 1890 (KNOWN AS THE MCKINLEY BILL).

See Alphabetical Index on p. 350.

An Act to Reduce the Revenue and Equalize Duties on Imports, and for Other Purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

That on and after the sixth day of October, eighteen hundred and ninety, unless otherwise specially provided for in this Act, there shall be levied, collected and paid upon all articles imported from foreign countries, and mentioned in the schedules herein contained, the rates of duty which are by the schedules and paragraphs respectively prescribed, namely:

Schedule A.—Chemicals, Oils and Paints.

ACIDS. **1.** Acetic or pyroligneous acid, not exceeding the specific gravity of one and forty-seven one-thousandths, one and one-half cents per pound; exceeding the specific gravity of one and forty-seven one-thousandths, four cents per pound.

2. Boracic acid, five cents per pound.

3. Chromic acid, six cents per pound.

4. Citric acid, ten cents per pound.

5. Sulphuric acid or oil of vitriol, not otherwise specially provided for, one-fourth of one cent per pound.

6. Tannic acid or tannin, seventy-five cents per pound.

7. Tartaric acid, ten cents per pound.

8. Alcoholic perfumery, including cologne water and other toilet waters, two dollars per gallon and fifty per centum ad valorem; alcoholic compounds not specially provided for in this act, two dollars per gallon and twenty-five per centum ad valorem.

9. Alumina, alum, alum cake, patent alum, sulphate of alumina, and aluminous cake, and alum in crystals or ground, six-tenths of one cent per pound.

10. Ammonia, carbonate of, one and three-fourths cents per pound; muriate of, or sal-ammoniac, three-fourths of one cent per pound; sulphate of, one-half of one cent per pound.

11. Blacking of all kinds, twenty-five per centum ad valorem.

12. Blue vitriol, or sulphate of copper, two cents per pound.

13. Bone-char, suitable for use in decolorizing sugars, twenty-five per centum ad valorem.

14. Borax, crude, or borate of soda, or borate of lime, three cents per pound; refined borax, five cents per pound.

15. Camphor, refined, four cents per pound.

16. Chalk, prepared, precipitated, French, and red, one cent per pound; all other chalk preparations not specially provided for in this act, twenty per centum ad valorem.

17. Chloroform, twenty-five cents per pound.

COAL-TAR PREPARATIONS. **18.** All coal-tar colors or dyes, by whatever name known, and not specially provided for in this act, thirty-five per centum ad valorem.

19. All preparations of coal-tar, not colors or dyes, not specially provided for in this act, twenty per centum ad valorem.

20. Cobalt, oxide of, thirty cents per pound.

21. Collodion and all compounds of pyroxyline, by whatever name known, fifty cents per pound; rolled or in sheets, but not made up into articles, sixty cents per pound; if in finished or partly finished articles, sixty cents per pound and twenty-five per centum ad valorem.

22. Coloring for brandy, wine, beer, or other liquors, fifty per centum ad valorem.

23. Copperas or sulphate of iron, three-tenths of one cent per pound.

24. Drugs, such as barks, beans, berries, balsams, buds, bulbs and bulbous roots, and excrescences, such as nut galls, fruits, flowers, dried fibers, grains, gums, and gum resins, herbs, leaves, lichens, mosses, nuts, roots and stems, spices, vegetables, seeds (aromatic, not garden seeds), and seeds of morbid growth, weeds, woods used expressly for dyeing, and dried insects, any of the foregoing which are not edible, but which have been advanced in value or condition by refining or grinding, or by other process of manufacture, and not specially provided for in this act, ten per centum ad valorem.

25. Ethers sulphuric, forty cents per pound; spirits of nitrous ether, twenty-five cents per pound; fruit ethers, oils or essences, two dollars and fifty cents per pound; ethers of all kinds not specially provided for in this act, one dollar per pound.

26. Extracts and decoctions of logwood and other dye-woods, extract of sumac and extracts of barks, such as are commonly used for dyeing or tanning, not specially provided for in this act, seven-eighths of one cent per pound; extracts of hemlock bark, one-half of one cent per pound.

27. Gelatine, glue and isinglass, or fish-glue, valued at not above seven cents per pound, one and one-half cents per pound; valued at above seven cents per pound and not above thirty cents per pound, twenty-five per centum ad valorem; valued at above thirty cents per pound, thirty per centum ad valorem.

28. Glycerine, crude, not purified, one and three-fourths cents per pound; refined, four and one-half cents per pound.

29. Indigo, extracts or paste of, three-fourths of one cent per pound; carmined, ten cents per pound.

30. Ink and ink-powders, printers' ink and all other ink not specially provided for in this act, thirty per centum ad valorem.

31. Iodine, resublimed, thirty cents per pound.

32. Iodoform, one dollar and fifty cents per pound.

33. Licorice, extracts of, in paste, rolls or other forms, five and one-half cents per pound.

34 Magnesia, carbonate of, medicinal, four cents per pound; calcined, eight cents per pound; sulphate of, or Epsom salts, three-tenths of one cent per pound.

35. Morphia, or morphine, and all salts thereof, fifty cents per ounce.

OILS. **36.** Alizarine assistant, or soluble oil, or oleate of soda, or Turkey red oil, containing fifty per centum or more of castor oil, eighty cents per gallon; containing less than fifty per centum of castor oil, forty cents per gallon; all other, thirty per centum ad valorem.

37. Castor oil, eighty cents per gallon.

38. Cod-liver oil, fifteen cents per gallon.

39. Cotton-seed oil, ten cents per gallon of seven and one-half pounds weight.

40. Croton oil, thirty cents per pound.

41. Flaxseed or linseed and poppy-seed oil, raw, boiled or oxidized, thirty-two cents per gallon of seven and one-half pounds weight.

42. Fusel oil, or amylic alcohol, ten per centum ad valorem.

43. Hemp-seed oil and rape-seed oil, ten cents per gallon.

44. Olive oil, fit for salad purposes, thirty-five cents per gallon.

45. Peppermint oil, eighty cents per pound.

46. Seal, herring, whale and other fish oil not specially provided for in this act, eight cents per gallon.

47. Opium, aqueous extract of, for medical uses, and tincture of, as laudanum, and all other liquid preparations of opium not specially provided for in this act, forty per centum ad valorem.

48. Opium, containing less than nine per centum of morphia, and opium prepared for smoking, twelve dollars per pound; but opium prepared for smoking and other preparations of opium deposited in bonded warehouse shall not be removed therefrom without payment of duties, and such duties shall not be refunded.

PAINTS, COLORS AND VARNISHES. **49.** Baryta, sulphate of, or barytes, including barytes earth unmanufactured, one dollar and twelve cents per ton; mannfactured, six dollars and seventy-two cents per ton.

50. Blues, such as Berlin, Prussian, Chinese and all other containing ferrocyanide of iron, dry or ground in or mixed with oil, six cents per pound; in pulp or mixed with water, six cents per pound on the material contained therein when dry.

51. Blanc-fixe, or satin white, or artificial sulphate of barytes, three-fourths of one cent per pound.

52. Black, made from bone, ivory or vegetable, under whatever name known, including bone-black and lamp-black, dry or ground in oil or water, twenty-five per centum ad valorem.

53. Chrome yellow, chrome green and all other chromium colors in which lead and bichromate of potash or soda are component parts, dry or ground in or mixed with oil, four and one-half cents per pound; in pulp or mixed with water, four and one-half cents per pound on the material contained therein when dry.

54. Ocher and ochery earths, sienna and sienna earths, umber and umber earths, not specially provided for in this act, dry, one-fourth of one cent per pound; ground in oil one and one-half cents per pound.

55. Ultramarine blue, four and one-half cents per pound.

56. Varnishes, including so-called gold size or japan, thirty-five per centum ad valorem; and on spirit varnishes for the alcohol contained therein, one dollar and thirty-two cents per gallon additional.

57. Vermilion red, and colors containing quicksilver, dry or ground in oil or water, twelve cents per pound.

58. Wash blue, containing ultramarine, three cents per pound.

59. Whiting and Paris white, dry, one-half of one cent per pound; ground in oil or putty, one cent per pound.

60. Zinc, oxide of, and white paint containing zinc, but not containing lead; dry, one and one fourth cents per pound; ground in oil, one and three-fourths cents per pound.

61. All other paints and colors, whether dry or mixed, or ground in water or oil, including lakes, crayons, smalts, and frostings, not specially provided for in this act, and artists' colors of all kinds, in tubes or otherwise, twenty-five per centum ad valorem. All paints and colors, mixed or ground with water or solutions other than oil, and commercially known as artists' water color paints, thirty per centum ad valorem.

LEAD PRODUCTS. **62.** Acetate of lead, white, five and one-half cents per pound; brown, three and one-half cents per pound.

63. Litharge, three cents per pound.

64. Nitrate of lead, three cents per pound.

65. Orange mineral, three and one-half cents per pound.

66. Red lead, three cents per pound.

67. White lead and white paint containing lead, dry or in pulp, or ground or mixed with oil, three cents per pound.

68 Phosphorus, twenty cents per pound.

POTASH. **69.** Bichromate and chromate of, three cents per pound

70. Caustic or hydrate of, refined, in sticks or rolls, one cent per pound.

71. Hydriodate, iodide, and iodate of, fifty cents per pound.

72. Nitrate of, or saltpeter, refined, one cent per pound.

73. Prussiate of, red, ten cents per pound; yellow, five cents per pound.

PREPARATIONS. **74.** All medicinal preparations, including medicinal proprietary preparations, of which alcohol is a component part, or in the preparation of which alcohol is used, not specially provided for in this act, fifty cents per pound.

75. All medicinal preparations, including medicinal proprietary preparations, of which alcohol is not a component part, and not specially provided for in this act, twenty-five per centum ad valorem; calomel and other mercurial medicinal preparations, thirty-five per centum ad valorem.

76. Products or preparations known as alkalies, alkaloids, distilled oils, essential oils, expressed oils, rendered oils, and all combinations of the foregoing, and all chemical compounds and salts, not specially provided for in this act, twenty-five per centum ad valorem.

77. Preparations used as applications to the hair, mouth, teeth, or skin, such as cosmetics, dentrifices, pastes, pomades, powders, and tonics, including all known as toilet preparations, not specially provided for in this act, fifty per centum ad valorem.

78. Santonine, and all salts thereof containing eighty per centum or over of Santonine, two dollars and fifty cents per pound.

79. Soap; castile soap, one and one-fourth cents per pound: fancy, perfumed, and all descriptions of toilet soap, fifteen cents per pound; all other soaps, not specially provided for in this act, twenty per centum ad valorem.

SODA. **80.** Bicarbonate of soda or supercarbonate of soda or saleratus, one cent per pound.

81. Hydrate of, or caustic soda, one cent per pound.

82. Bichromate and chromate of, three cents per pound.

83. Sal soda or soda-crystals, and soda-ash, one-fourth of one cent per pound.

84. Silicate of soda, or other alkaline silicate, one-half of one cent per pound.

85. Sulphate of soda, or salt-cake, or niter-cake, one dollar and twenty-five cents per ton.

86. Sponges, twenty per centum ad valorem.

87. Strychnia, or strychnine, and all salts thereof, forty cents per ounce.

88. Sulphur, refined, eight dollars per ton; sublimed, or flowers of, ten dollars per ton.

89. Sumac, ground, four-tenths of one cent per pound.

90. Tartar, cream of, and patent tartar, six cents per pound.

91. Tartars and lees crystals, partly refined, four cents per pound.

92. Tartrate of soda and potassa, or Rochelle salts, three cents per pound.

Schedule B.—Earths, Earthenware and Glassware.

BRICK AND TILE. **93.** Fire-brick, not glazed, enameled, ornamented or decorated in any manner, one dollar and twenty-five cents per ton; glazed, enameled, ornamented or decorated, forty-five per centum ad valorem.

94. Tiles and brick, other than fire-brick, not glazed, ornamented, painted, enameled, vitrified, or decorated, twenty-five per centum ad valorem; ornamented, glazed, painted, enameled, vitrified, or decorated, and all encaustic, forty-five per centum ad valorem.

CEMENT, LIME AND PLASTER. **95.** Roman, Portland, and other hydraulic cement, in barrels, sacks, or other packages, eight cents per one hundred pounds, including weight of barrel or package; in bulk, seven cents per one hundred pounds; other cement, twenty per centum ad valorem.

96. Lime, six cents per one hundred pounds; including weight of barrel or package.

97. Plaster of Paris, or gypsum, ground, one dollar per ton; calcined, one dollar and seventy-five cents per ton.

CLAYS OR EARTHS **98.** Clays or earths, unwrought or unmanufactured, not specially provided for in this act, one dollar and fifty cents per ton; wrought or manufactured, not specially provided for in this act, three dollars per ton; china, clay, or kaolin, three dollars per ton.

EARTHENWARE AND CHINA. **99.** Common brown earthenware, common stoneware, and crucibles, not ornamented or decorated in any manner, twenty-five per centum ad valorem.

100. China, porcelain, parian, bisque, earthen, stone, and crockery ware, in-

cluding plaques, ornaments, toys, charms, vases, and statuettes, painted, tinted, stained, enameled, printed, gilded, or otherwise decorated or ornamented in any manner, sixty per centum ad valorem; if plain white, and not ornamented or decorated in any manner, fifty-five per centum ad valorem.

101. All other china, porcelain, parian, bisque, earthen, stone, and crockery ware and manufactures of the same, by whatsoever designation or name known in the trade, including lava tips for burners, not specially provided for in this act, if ornamented or decorated in any manner, sixty per centum ad valorem; if not ornamented or decorated, fifty-five per centum ad valorem.

102. Gas retorts, three dollars each.

GLASS AND GLASSWARE. **103.** Green and colored, molded or pressed and flint, and lime glass bottles, holding more than one pint, and demijohns, and carboys (covered or uncovered), and other molded or pressed green and colored and flint or lime bottle glassware, not specially provided for in this act, one cent per pound. Green, and colored, molded or pressed, and flint, and lime glass bottles, and vials holding not more than one pint and not less than one-quarter of a pint, one and one-half cents per pound; if holding less than one-fourth of a pint, fifty cents per gross.

104. All articles enumerated in the preceding paragraph, if filled, and not otherwise provided for in this act, and the contents are subject to an ad valorem rate of duty, or to a rate of duty based upon the value, the value of such bottles, vials, or other vessels shall be added to the value of the contents for the ascertainment of the dutiable value of the latter; but if filled, and not otherwise provided for in this act, and the contents are not subject to an ad valorem rate of duty, or to rate of duty based on the value, or are free of duty, such bottles, vials or other vessels shall pay, in addition to the duty, if any, on their contents, the rates of duty prescribed in the preceding paragraph: *Provided*, That no article manufactured from glass described in the preceding paragraph shall pay a less rate of duty than forty per centum ad valorem.

105. Flint and lime, pressed glassware, not cut, engraved, painted, etched, decorated, colored, printed, stained, silvered, or gilded, sixty per centum ad valorem.

106. All articles of glass, cut, engraved, painted, colored, printed, stained, decorated, silvered, or gilded, not including plate glass silvered, or looking-glass plates, sixty per centum ad valorem.

107. Chemical glassware for use in laboratory, and not otherwise specially provided for in this act, forty-five per centum ad valorem.

108. Thin blown glass, blown with or without a mold, including glass chimneys and all other manufactures of glass, or of which glass shall be the component material of chief value, not specially provided for in this act, sixty per centum ad valorem.

109. Heavy blown glass, blown with or without a mold, not cut or decorated, finished or unfinished, sixty per centum ad valorem.

110. Porcelain or opal glassware, sixty per centum ad valorem.

111. All cut, engraved, painted or otherwise ornamented or decorated glass bottles, decanters, or other vessels of glass shall, if filled, pay duty in addition to any duty chargeable on the contents, as if not filled, unless otherwise specially provided for in this act.

112. Unpolished cylinder, crown and common window-glass, not exceeding ten by fifteen inches square, one and three-eighths cents per pound; above that, and not exceeding sixteen by twenty-four inches square, one and seven-eighths cents per pound; above that, and not exceeding twenty-four by thirty inches square, two and three-eighths cents per pound; above that, and not exceeding twenty-four by thirty-six inches square, two and seven-eighths cents per pound; all above that, three and one-eighth cents per pound: *Provided*, That unpolished cylinder, crown and common window-glass, imported in boxes, shall contain fifty square feet, as nearly as sizes will permit, and the duty shall be computed thereon according to the actual weight of the glass.

113. Cylinder and crown-glass, polished, not exceeding sixteen by twenty-four inches square, four cents per square foot; above that, and not exceeding

twenty-four by thirty inches square, six cents per square foot; above that, and not exceeding twenty-four by sixty inches square, twenty cents per square foot; above that, forty cents per square foot.

114. Fluted, rolled or rough plate-glass, not including crown, cylinder or common window-glass, not exceeding ten by fifteen inches square, three-fourths of one cent per square foot; above that, and not exceeding sixteen by twenty-four inches square, one cent per square foot; above that, and not exceeding twenty-four by thirty inches square, one and one-half cents per square foot; all above that, two cents per square foot; and all fluted, rolled or rough plate-glass, weighing over one hundred pounds per one hundred square feet, shall pay an additional duty on the excess at the same rates herein imposed: *Provided*, That all of the above plate-glass when ground, smoothed or otherwise obscured shall be subject to the same rate of duty as cast polished plate-glass unsilvered.

115. Cast polished plate-glass, finished or unfinished and unsilvered, not exceeding sixteen by twenty-four inches square, five cents per square foot; above that, and not exceeding twenty-four by thirty inches square, eight cents per square foot; above that, and not exceeding twenty-four by sixty inches square, twenty-five cents per square foot; all above that, fifty cents per square foot.

116. Cast polished plate-glass, silvered and looking-glass plates, not exceeding sixteen by twenty-four inches square, six cents per square foot; above that, and not exceeding twenty-four by thirty inches square, ten cents per square foot; above that, and not exceeding twenty-four by sixty inches square, thirty-five cents per square foot; all above that, sixty cents per square foot.

117. But no looking-glass plates, or plate-glass silvered, when framed, shall pay a less rate of duty than that imposed upon similar glass of like description not framed, but shall pay in addition thereto upon such frames the rate of duty applicable thereto when imported separate.

118. Cast polished plate-glass, silvered or unsilvered, and cylinder, crown or common window-glass, when ground, obscured, frosted, sanded, enameled, beveled, etched, embossed, engraved, stained, colored or otherwise ornamented or decorated, shall be subject to a duty of ten per centum ad valorem in addition to the rates otherwise chargeable thereon.

119. Spectacles and eye-glasses, or spectacles and eye-glass frames, sixty per centum ad valorem.

120. On lenses costing one dollar and fifty cents per gross pairs, or less, sixty per centum ad valorem.

121. Spectacle and eye-glass lenses with their edges ground or beveled to fit frames, sixty per centum ad valorem.

122. All stained or painted window-glass and stained or painted glass windows, and hand, pocket or table mirrors, not exceeding in size one hnndred and forty-four square inches, with or without frames or cases, of whatever material composed, lenses of glass or pebble, wholly or partly manufactured, and not specially provided for in this act, and fusible enamel, forty-five per centum ad valorem.

MARBLE AND STONE, AND MANUFACTURES OF. **123.** Marble of all kinds in block, rough or squared, sixty-five cents per cubic foot.

124. Veined marble, sawed, dressed or otherwise, including marble slabs and marble paving-tiles, one dollar and ten cents per cubic foot (but in measurement no slab shall be computed at less than one inch in thickness).

125. Manufactures of marble not specially provided for in this act, fifty per centum ad valorem.

STONE **126.** Burr-stones manufactured or bound up into mill-stones, fifteen per centum ad valorem.

127. Freestone, granite, sandstone, limestone, and other building or monumental stone, except marble, manufactured or undressed, not specially provided for in this act, eleven cents per cubic foot.

128. Freestone, granite, sandstone, limestone, and other building or monumental stone, except marble, not specially provided for in this act, hewn, dressed, or polished, forty per centum ad valorem.

129. Grindstones, finished or unfinished, one dollar and seventy-five cents per ton.

SLATE. **130.** Slates, slate-chimney pieces, mantels, slabs for tables and all other manufactures of slate, not specially provided for in this act, thirty per centum ad valorem.

131. Roofing slates, twenty-five per centum ad valorem.

Schedule C.—Metals and Manufactures of.

IRON AND STEEL. **132.** Chromate of iron, or chromic ore, fifteen per centum ad valorem.

133. Iron ore, including manganiferous iron ore, also the dross or residuum from burnt pyrites, seventy-five cents per ton. Sulphur ore, as pyrites, or sulphuret of iron in its natural state, containing not more than three and one-half per centum copper, seventy-five cents per ton: *Provided*, That ore containing more than two per centum of copper shall pay, in addition thereto, one-half of one cent per pound for the copper contained therein: *Provided, also*, That sulphur ore as pyrites or sulphuret of iron in its natural state, containing in excess of twenty-five per centum of sulphur, shall be free of duty, except on the copper contained therein, as above provided: *And provided further*, That in levying and collecting the duty on iron ore no deduction shall be made from the weight of the ore on account of moisture which may be chemically or physically combined therewith.

134. Iron in pigs, iron kentledge, spiegeleisen, ferro-manganese, ferro-silicon, wrought and cast scrap iron, and scrap steel, three-tenths of one cent per pound; but nothing shall be deemed scrap iron or scrap steel except waste or refuse iron or steel fit only to be remanufactured.

135. Bar-iron, rolled or hammered, comprising flats not less than one inch wide, nor less than three-eighths of one inch thick, eight-tenths of one cent per pound; round iron not less than three-fourths of one inch in diameter, and square iron not less than three-fourths of an inch square, nine-tenths of one cent per pound; flats less than one inch wide, or less than three-eighths of one inch thick; round iron less than three-fourths of one inch and not less than seven-sixteenths of one inch in diameter; and square iron less than three-fourths of one inch square, one cent per pound.

136. Round iron, in coils or rods, less than seven-sixteenths of one inch in diameter, and bars or shapes of rolled iron, not specially provided for in this act, one and one-tenth cents per pound: *Provided*, That all iron in slabs, blooms, loops, or other forms less finished than iron in bars, and more advanced than pig-iron, except castings, shall be rated as iron in bars, and be subject to a duty of eight-tenths of one cent per pound; and none of the iron above enumerated in this paragraph shall pay a less rate of duty than thirty-five per centum ad valorem: *Provided further*, That all iron bars, blooms, billets, or sizes or shapes of any kind, in the manufacture of which charcoal is used as fuel, shall be subject to a duty of not less than twenty-two dollars per ton.

137. Beams, girders, joists, angles, channels, car truck channels, T T, columns and posts, or parts or sections of columns and posts, deck and bulb beams, and building forms, together with all other structural shapes, of iron or steel, whether plain or punched, or fitted for use, nine-tenths of one cent per pound.

138. Boiler or other plate iron or steel, except saw plates hereinafter provided for, not thinner than number ten wire gauge, sheared or unsheared, and skelp iron or steel, sheared or rolled in grooves, valued at one cent per pound or less, five-tenths of one cent per pound; valued above one cent and not above one and four-tenths cents per pound, sixty-five hundredths of one cent per pound; valued above one and four-tenths cents, and not above two cents per pound, eight-tenths of one cent per pound; valued above two cents and not above three cents per pound, one and one-tenth cents per pound; valued above three cents and not above four cents per ponnd, one and five-tenths cents per pound; valued above four cents and not above seven cents per pound, two cents per pound; valued above seven cents and not above ten cents per pound, two and eight-tenths

cents per pound; valued above ten cents and not above thirteen cents per pound, three and one-half cents per pound; valued above thirteen cents per pound, forty-five per centum ad valorem: *Provided*, That all plate iron or steel thinner than number ten wire gauge shall pay duty as iron or steel sheets.

139. Forgings of iron or steel, or forged iron and steel combined, of whatever shape, or in whatever stage of manufacture, not specially provided for in this act, two and three-tenths cents per pound: *Provided*, That no forgings of iron or steel, or forgings of iron and steel combined, by whatever process made, shall pay a less rate of duty than forty-five per centum ad valorem.

140. Hoop, or band, or scroll, or other iron or steel, valued at three cents per pound or less, eight inches or less in width, and less than three-eighths of one inch thick, and not thinner than number ten wire gauge, one cent per pound; thinner than number ten wire gauge and not thinner than number twenty wire gauge, one and one-tenth cents per pound; thinner than number twenty wire gauge, one and three-tenths cents per pound: *Provided*, That hoop or band iron, or hoop or band steel, cut to length, or wholly or partially manufactured into hoops or ties for baling purposes, barrel hoops of iron or steel, and hoop or band iron, or hoop or band steel flared, splayed or punched, with or without buckles or fastenings, shall pay two-tenths of one cent per pound more duty than that imposed on the hoop or band iron or steel from which they are made.

141. Railway bars, made of iron or steel, and railway bars made in part of steel, T-rails, and punched iron or steel flat rails, six-tenths of one cent per pound.

142. Sheets of iron or steel, common or black, including all iron or steel commercially known as common or black taggers iron or steel, and skelp iron or steel, valued at three cents per pound or less: Thinner than number ten and not thinner than number twenty wire gauge. one cent per pound; thinner than number twenty wire gauge and not thinner than number twenty-five wire gauge, one and one-tenths cents per pound; thinner than number twenty-five wire gauge, one and four-tenths cents per pound; corrugated or crimped, one and four-tenths cents per pound: *Provided*, That all common or black sheet-iron or sheet-steel not thinner than number ten wire gauge shall pay duty as plate iron or plate steel.

143. All iron or steel sheets or plates, and all hoop, band, or scroll iron or steel, excepting what are known commercially as tin plates, terne plates, and taggers tin, and hereinafter provided for, when galvanized or coated with zinc or spelter, or other metals, or any alloy of those metals, shall pay three-fourths of one cent per pound more duty than the rates imposed by the preceding paragraph upon the corresponding gauges, or forms, of common or black sheet or taggers iron or steel; and on and after July first, eighteen hundred and ninety-one, all iron or steel sheets, or plates, or taggers iron coated with tin or lead or with a mixture of which these metals or either of them is a component part, by the dipping or any other process, and commercially known as tin plates, terne plates, and taggers tin, shall pay two and two-tenths cents per pound: *Provided*, That on and after July first, eighteen hundred and ninety-one, manufactures of which tin, tin plates, terne plates, taggers tin, or either of them, are component materials of chief value, and all articles, vessels or wares manufactured, stamped or drawn from sheet-iron or sheet-steel, such material being the component of chief value, and coated wholly or in part with tin or lead or a mixture of which these metals or either of them is a component part, shall pay a duty of fifty-five per centum ad valorem: *Provided*, That on and after October first, eighteen hundred and ninety-seven, tin plates and terne plates lighter in weight than sixty-three pounds per hundred square feet shall be admitted free of duty, unless it shall be made to appear to the satisfaction of the President (who shall thereupon by proclamation make known the fact) that the aggregate quantity of such plates lighter than sixty-three pounds per hundred square feet produced in the United States during either of the six years next preceding June thirtieth, eighteen hundred and ninety-seven, has equaled one-third the amount of such plates imported and entered for consumption during any fiscal year after the passage of this act, and prior to said October first, eighteen hundred and ninety-

seven: *Provided*, That the amount of such plates manufactured into articles exported, and upon which a drawback shall be paid, shall not be included in ascertaining the amount of such importations: *And provided further*, That the amount or weight of sheet-iron or sheet-steel manufactured in the United States and applied or wrought in the manufacture of articles or wares tinned or terne-plated in the United States, with weight allowance as sold to manufacturers or others, shall be considered as tin and terne plates produced in the United States within the meaning of this act.

144. Sheet-iron or sheet-steel, polished, planished, or glanced, by whatever name designated, two and one-half cents per pound: *Provided*, That plate or sheet or taggers iron or steel, by whatever name designated, other than the polished, planished, or glanced herein provided for, which has been pickled or cleaned by acid, or by any other material or process, or which is cold-rolled, smoothed only, not polished, shall pay one-quarter of one cent per pound more duty than the corresponding gauges of common or black sheet or taggers iron or steel.

145. Sheets or plates of iron or steel, or taggers iron or steel, coated with tin or lead, or with a mixture of which these metals, or either of them, is a component part, by the dipping or any other process, and commercially known as tin-plates, terne plates, and taggers tin, one cent per pound until July first, eighteen hundred and ninety-one.

146. Steel ingots, cogged ingots, blooms and slabs, by whatever process made; die blocks or blanks; billets and bars and tapered or beveled bars; steamer, crank and other shafts; shafting; wrist or crank pins; connecting-rods and piston-rods; pressed, sheared or stamped shapes; saw-plates, wholly or partially manufactured; hammer molds or swagged steel; gun-barrel molds not in bars; alloys used as substitutes for steel tools; all descriptions and shapes of dry sand, loam, or iron-molded steel castings; sheets and plates not specially provided for in this act; and steel in all forms and shapes not specially provided for in this act; all of the above valued at one cent per pound or less, four-tenths of one cent per pound; valued above one cent and not above one and four-tenths cents per pound, five-tenths of one cent per pound; valued above one and four-tenths cents and not above one and eight-tenths cents per pound, eight-tenths of one cent per pound; valued above one and eight-tenths cents and not above two and two-tenths cents per pound, nine-tenths of one cent per pound; valued above two and two-tenths cents and not above three cents per pound, one and two-tenths cents per pound; valued above three cents and not above four cents per pound, one and six-tenths cents per pound; valued above four cents and not above seven cents per pound, two cents per pound; valued above seven cents and not above ten cents per pound, two and eight-tenths cents per pound; valued above ten cents and not above thirteen cents per pound, three and one-half cents per pound; valued above thirteen cents and not above sixteen cents per pound, four and two-tenths cents per pound; valued above sixteen cents per pound, seven cents per pound.

WIRE. **147.** Wire rods: Rivet, screw, fence and other iron or steel wire rods, and nail rods, whether round, oval, flat, square, or in any other shape, in coils or otherwise, not smaller than number six wire guage, valued at three and one-half cents or less per pound, six-tenths of one cent per pound; and iron or steel, flat, with longitudinal ribs, for the manufacture of fencing, valued at three cents or less per pound, six-tenths of one cent per pound: *Provided*, That all iron or steel rods, whether rolled or drawn through dies, smaller than number six wire gauge, shall be classed and dutiable as wire.

148. Wire made of iron or steel, not smaller than number ten wire gauge, one and one-fourth cents per pound; smaller than number ten and not smaller than number sixteen wire gauge, one and three-fourths cents per pound; smaller than number sixteen and not smaller than number twenty-six wire gauge, two and one-fourth cents per pound; smaller than number twenty-six wire gauge, three cents per pound: *Provided*, That iron or steel wire covered with cotton, silk, or other material, and wires or strip steel, commonly known as crinoline wire, corset wire and hat wire, shall pay a duty of five cents per pound: *And provided further*, That flat steel wire, or sheet steel in strips, whether drawn through dies or rolls, untempered or tempered, of whatsoever width, twenty-five one-thousandths

of an inch thick or thinner (ready for use or otherwise), shall pay a duty of fifty per centum ad valorem: *And provided further*, That no article made from iron or steel wire, or of which iron or steel wire is a component part of chief value, shall pay a less rate of duty than the iron or steel wire from which it is made either wholly or in part: *And provided further*, That iron or steel cloths, and iron or steel wire nettings made in meshes of any form, shall pay a duty equal in amount to that imposed on iron or steel wire used in the manufacture of iron or steel wire cloth, or iron or steel wire nettings, and two cents per pound in addition thereto.

There shall be paid on iron or steel wire coated with zinc or tin, or any other metal (except fence-wire and iron or steel, flat, with longitudinal ribs, for the manufacture of fencing), one-half of one cent per pound in addition to the rate imposed on the wire of which it is made; on iron wire rope and wire strand, one cent per pound in addition to the rate imposed on the wire of which it is made; on steel wire rope and wire strand, two cents per pound in addition to the rate imposed on the wire of which they or either of them are made. *Provided further*, That all iron or steel wire valued at more than four cents per pound shall pay a duty of not less than forty-five per centum ad valorem, except that card-wire for the manufacture of card clothing shall pay a duty of thirty-five per centum ad valorem.

General Provisions.

149. No allowance or reduction of duties for partial loss or damage in consequence of rust or of discoloration shall be made upon any description of iron or steel, or upon any article wholly or partly manufactured of iron or steel, or upon any manufacture of iron and steel.

150. All metal produced from iron or its ores, which is cast and malleable, of whatever description or form, without regard to the percentage of carbon contained therein, whether produced by cementation, or converted, cast, or made from iron or its ores, by the crucible, Bessemer, Clapp-Griffiths, pneumatic, Thomas-Gilchrist, basic, Siemens-Martin, or open-hearth process, or by the equivalent of either, or by a combination of two or more of the processes, or their equivalents, or by any fusion or other process which produces from iron or its ores a metal either granular or fibrous in structure, which is cast and malleable, excepting what is known as malleable-iron castings, shall be classed and denominated as steel.

151. No article not specially provided for in this act, wholly or partly manufactured from tin plate, terne plate, or the sheet, plate, hoop, band, or scroll iron or steel herein provided for, or of which such tin plate, terne plate, sheet, plate, hoop, band, or scroll iron or steel shall be the material of chief value, shall pay a lower rate of duty than that imposed on the tin plate, terne plate, or sheet, plate, hoop, band, or scroll iron or steel from which it is made, or of which it shall be the component thereof of chief value.

152. On all iron or steel bars or rods of whatever shape or section, which are cold rolled, cold hammered, or polished in any way in addition to the ordinary process of hot rolling or hammering, there shall be paid one-fourth of one cent per pound in addition to the rates provided in this act; and on all strips, plates, or sheets of iron or steel of whatever shape, other than the polished, planished, or glanced sheet-iron or sheet-steel hereinbefore provided for, which are cold rolled, cold hammered, blued, brightened, tempered, or polished by any process to such perfected surface finish, or polish better than the grade of cold rolled, smooth only, hereinbefore provided for, there shall be paid one and one-fourth cents per pound in addition to the rates provided in this act upon plates, strips or sheets of iron or steel of common or black finish; and on steel circular saw plates there shall be paid one cent per pound in addition to the rate provided in this act for steel saw plates.

MANUFACTURES OF IRON AND STEEL. **153.** Anchors, or parts thereof, of iron or steel, mill irons and mill cranks of wrought iron, and wrought iron for ships, and forgings of iron or steel or of combined iron and steel, for

vessels, steam engines and locomotives, or parts thereof, weighing each twenty-five pounds or more, one and eight-tenths cents per pound.

154. Axles, or parts thereof, axle-bars, axle-blanks, or forgings for axles, whether of iron or steel, without reference to the stage or state of manufacture, two cents per pound: *Provided*, That when iron or steel axles are imported fitted in wheels, or parts of wheels, of iron or steel, they shall be dutiable at the same rate as the wheels in which they are fitted.

155. Anvils of iron or steel, or of iron and steel combined, by whatever process made or in whatever stage of manufacture, two and one-half cents per pound.

156. Blacksmiths' hammers and sledges, track tools, wedges and crowbars, whether of iron or steel, two and one-fourth cents per pound.

157. Boiler or other tubes, pipes, flues or stays of wrought iron or steel, two and one-half cents per pound.

158. Bolts, with or without threads or nuts, or bolt-blanks, and finished hinges or hinge-blanks, whether of iron or steel, two and one-fourth cents per pound.

159. Card clothing, manufactured from tempered steel wire, fifty cents per square foot; all other, twenty-five cents per square foot.

160. Cast iron pipe of every description, nine-tenths of one cent per pound.

161. Cast iron vessels, plates, stove-plates, andirons, sadirons, tailors' irons, hatters' irons and castings of iron not specially provided for in this act, one and two-tenths cents per pound.

162. Castings of malleable iron not specially provided for in this act, one and three-fourths cents per pound.

163. Cast hollow ware, coated, glazed or tinned, three cents per pound.

164. Chain or chains of all kinds, made of iron or steel, not less than three-fourths of one inch in diameter, one and six-tenths cents per pound; less than three-fourths of one inch and not less than three-eighths of one inch in diameter, one and eight-tenths cents per pound; less than three-eighths of one inch in diameter, two and one-half cents per pound, but no chain or chains of any description shall pay a lower rate of duty than forty-five per centum ad valorem.

CUTLERY. **165.** Pen-knives or pocket-knives of all kinds, or parts thereof, and erasers, or parts thereof, wholly or partly manufactured, valued at not more than fifty cents per dozen, twelve cents per dozen; valued at more than fifty cents per dozen, and not exceeding one dollar and fifty cents per dozen, fifty cents per dozen; valued at more than one dollar and fifty cents per dozen and not exceeding three dollars per dozen, one dollar per dozen; valued at more than three dollars per dozen, two dollars per dozen, and in addition thereto on all the above, fifty per centum ad valorem. Razors and razor blades, finished or unfinished, valued at less than four dollars per dozen, one dollar per dozen; valued at four dollars or more per dozen, one dollar and seventy-five cents per dozen, and in addition thereto on all the above razors and razor blades, thirty per centum ad valorem.

166. Swords, sword-blades and side-arms, thirty-five per centum ad valorem.

167. Table-knives, forks, steels and all butchers', hunting, kitchen, bread, butter, vegetable, fruit, cheese, plumbers', painters', palette and artists' knives of all sizes, finished or unfinished, valued at not more than one dollar per dozen pieces, ten cents per dozen; valued at more than one dollar and not more than two dollars, thirty-five cents per dozen; valued at more than two dollars and not more than three dollars, forty cents per dozen; valued at more than three dollars and not more than eight dollars, one dollar per dozen; valued at more than eight dollars, two dollars per dozen, and in addition upon all the above named articles, thirty per centum ad valorem. All carving and cooks' knives and forks of all sizes, finished or unfinished, valued at not more than four dollars per dozen pieces, one dollar per dozen; valued at more than four dollars and not more than eight dollars, two dollars per dozen pieces; valued at more than eight dollars and not more than twelve dollars, three dollars per dozen pieces; valued at more than twelve dollars, five dollars per dozen pieces, and in addition upon all the above named articles, thirty per centum ad valorem.

168. Files, file-blanks, rasps, and floats, of all cuts and kinds, four inches in length and under, thirty-five cents per dozen; over four inches in length and under nine inches, seventy-five cents per dozen; nine inches in length and under fourteen inches, one dollar and thirty cents per dozen; fourteen inches in length and over, two dollars per dozen.

FIRE-ARMS. **169.** Muskets and sporting-rifles, twenty-five per centum ad valorem.

170. All double-barreled, sporting, breech-loading shot-guns valued at not more than six dollars each, one dollar and fifty cents each; valued at more than six dollars and not more than twelve dollars each, four dollars each; valued at more than twelve dollars each, six dollars each; and in addition thereto on all the above, thirty-five per centum ad valorem. Single-barrel, breach-loading shot-guns, one dollar each and thirty-five per centum ad valorem. Revolving pistols valued at not more than one dollar and fifty cents each, forty cents each; valued at more than one dollar and fifty cents, one dollar each; and in addition thereto on all the above pistols, thirty-five per centum ad valorem.

171. Iron or steel sheets, plates, wares, or articles, enameled or glazed with vitreous glasses, forty-five per centum ad valorem.

172. Iron or steel sheets, plates, wares, or articles, enameled or glazed as above with more than one color, or ornamented, fifty per centum ad valorem.

NAILS, SPIKES, TACKS AND NEEDLES. **173.** Cut nails and cut spikes of iron or steel, one cent per pound.

174. Horseshoe nails, hob nails, and all other wrought iron or steel nails not specially provided for in this act, four cents per pound.

175. Wire nails made of wrought iron or steel, two inches long and longer, not lighter than number twelve wire gauge, two cents per pound; from one inch to two inches in length, and lighter than number twelve and not lighter than number sixteen wire gauge, two and one-half cents per pound; shorter than one inch and lighter than number sixteen wire gauge, four cents per pound.

176. Spikes, nuts and washers, and horse, mule, or ox shoes, of wrought iron or steel, one and eight-tenths cents per pound.

177. Cut tacks, brads, or springs, not exceeding sixteen ounces to the thousand, two and one-fourth cents per thousand; exceeding sixteen ounces to the thousand, two and three-fourths cents per pound.

178. Needles for knitting or sewing machines, crochet-needles, and tape-needles and bodkins made of metal, thirty-five per centum ad valorem.

179. Needles, knitting, and all others not specially provided for in this act, twenty-five per centum ad valorem.

PLATES. **180.** Steel plates engraved, stereotype plates, electrotype plates, and plates of other materials, engraved or lithographed for printing, twenty-five per centum ad valorem.

181. Railway fish-plates, or splice bars, made of iron or steel, one cent per pound.

182. Rivets of iron or steel, two and one-half cents per pound.

SAWS. **183.** Cross-cut saws, eight cents per linear foot; mill, pit and drag-saws, not over nine inches wide, ten cents per linear foot; over nine inches wide, fifteen cents per linear foot; circular saws, thirty per centum ad valorem; hand, buck and all other saws, not specially provided for in this act, forty per centum ad valorem.

184. Screws, commonly called wood screws, more than two inches in length, five cents per pound; over one inch and not more than two inches in length, seven cents per pound; over one-half inch and not more than one inch in length, ten cents per pound; one-half inch and less in length, fourteen cents per pound.

185. Wheels, or parts thereof, made of iron or steel, and steel-tired wheels for railway purposes, whether wholly or partly finished, and iron or steel locomotive, car, or other railway tires or parts thereof, wholly or partly manufactured, two and one-half cents per pound; and ingots, cogged ingots, blooms or blanks for the same, without regard to the degree of manufacture, one and three-fourths cents per pound: *Provided*, That when wheels or parts thereof, of iron or steel, are imported with iron or steel axles fitted in them, the wheels and axles together

shall be dutiable at the same rate as is provided for the wheels when imported separately.

MISCELLANEOUS METALS AND MANUFACTURES OF. **186.** Aluminium or aluminum, in crude form, and alloys of any kind in which aluminum is the component material of chief value, fifteen cents per pound.

187. Antimony, as regulus or metal, three-fourths of one cent per pound.

188. Argentine, albata, or German silver, unmanufactured, twenty-five per centum ad valorem.

189. Brass, in bars or pigs, old brass, clippings from brass or Dutch metal, and old sheathing, or yellow metal, fit only for remanufacture, one and one-half cents per pound.

190. Bronze powder, twelve cents per pound; bronze or Dutch metal, or aluminum, in leaf, eight cents per package of one hundred leaves.

COPPER. **191.** Copper imported in the form of ores, one-half of one cent per pound on each pound of fine copper contained therein.

192. Old copper, fit only for remanufacture, clippings from new copper, and all composition metal of which copper is a component material of chief value, not specially provided for in this act, one cent per pound.

193. Regulus of copper and black or coarse copper, and copper cement, one cent per pound on each pound of fine copper contained therein.

194. Copper in plates, bars, ingots, Chili or other pigs, and in other forms, not manufactured, not specially provided for in this act, one and one-fourth cents per pound.

195. Copper in rolled plates, called braziers' copper, sheets, rods, pipes, and copper bottoms, also sheathing or yellow metal of which copper is the component material of chief value, and not composed wholly or in part of iron ungalvanized, thirty-five per centum ad valorem.

GOLD AND SILVER. **196.** Bullions and metal thread of gold, silver, or other metals, not specially provided for in this act, thirty per centum ad valorem.

197. Gold leaf, two dollars per package of five hundred leaves.

198. Silver leaf, seventy-five cents per package of five hundred leaves

LEAD. **199.** Lead ore and lead dross, one and one-half cents per pound: *Provided*, That silver ore and all other ores containing lead shall pay a duty of one and one-half cents per pound on the lead contained therein, according to sample and assay at the port of entry.

200. Lead in pigs and bars, molten and old refuse lead run into blocks and bars, and old scrap lead fit only to be remanufactured, two cents per pound.

201. Lead in sheets, pipe, shot, glaziers' lead, and lead wire, two and one-half cents per pound.

202. Metallic mineral substances in a crude state and metals unwrought, not specially provided for in this act, twenty per centum ad valorem; mica, thirty-five per centum ad valorem.

NICKEL **203.** Nickel, nickel oxide, alloy of any kind in which nickel is the component material of chief value, ten cents per pound.

204. Pens, metallic, except gold pens, twelve cents per gross.

205. Pen-holder tips, pen-holders or parts thereof, and gold pens, thirty per centum ad valorem.

206. Pins, metallic, solid-head or other, including hair-pins, safety-pins, and hat, bonnet, shawl and belt-pins, thirty per centum ad valorem.

207. Quicksilver, ten cents per pound. The flasks, bottles or other vessels in which quicksilver is imported shall be subject to the same rate of duty as they would be subjected to if imported empty.

208. Type metal, one and one-half cents per pound for the lead contained therein; new types, twenty-five per centum ad valorem.

TIN. **209.** On and after July first, eighteen hundred and ninety-three, there shall be imposed and paid upon cassiterite or black oxide of tin, and upon bar, block, and pig tin, a duty of four cents per pound: *Provided*, That unless it shall be made to appear to the satisfaction of the President of the United States (who shall make known the fact by proclamation) that the product of the mines of the United States shall have exceeded five thousand tons of cassiterite, and bar,

block, and pig tin in any one year prior to July first, eighteen hundred and ninety-five, then all imported cassiterite, bar, block, and pig tin shall after July first, eighteen hundred and ninety-five, be admitted free of duty.

WATCHES. **210.** Chronometers, box or ship's, and parts thereof, ten per centum ad valorem.

211. Watches, parts of watches, watch cases, watch movements, and watch-glasses, whether separately packed or otherwise, twenty-five per centum ad valorem.

ZINC OR SPELTER. **212.** Zinc in blocks or pigs, one and three-fourths cents per pound.

213. Zinc in sheets, two and one-half cents per pound.

214. Zinc, old and worn out, fit only to be remanufactured, one and one-fourth cents per pound.

215. Manufactures, articles or wares, not specially enumerated or provided for in this act, composed wholly or in part of iron, steel, lead, copper, nickel, pewter, zinc, gold, silver, platinum, aluminum, or any other metal, and whether partly or wholly manufactured, forty-five per centum ad valorem.

Schedule D.—Wood and Manufactures of.

216. Timber, hewn and sawed, and timber used for spars and in building wharves, ten per centum ad valorem.

217. Timber, squared or sided, not specially provided for in this act, one-half of one cent per cubic foot.

218. Sawed boards, planks, deals, and other lumber of hemlock, white wood, sycamore, white pine and basswood, one dollar per thousand feet board measure; sawed lumber, not specially provided for in this act, two dollars per thousand feet board measure; but when lumber of any sort is planed or finished, in addition to the rates herein provided, there shall be levied and paid for each side so planed or finished fifty cents per thousand feet board measure; and if planed on one side and tongued and grooved, one dollar per thousand feet board measure; and if planed on two sides, and tongued and grooved, one dollar and fifty cents per thousand feet board measure; and in estimating board measure under this schedule no deduction shall be made on board measure on account of planing, tonguing and grooving: *Provided*, That in case any foreign country shall impose an export duty upon pine, spruce, elm, or other logs, or upon stave bolts, shingle wood, or heading blocks exported to the United States from such country, then the duty upon the sawed lumber herein provided for, when imported from such country, shall remain the same as fixed by the law in force prior to the passage of this act.

219. Cedar: That on and after March first, eighteen hundred and ninety-one, paving posts, railroad ties, and telephone and telegraph poles of cedar, shall be dutiable at twenty per centum ad valorem.

220. Sawed boards, planks, deals, and all forms of sawed cedar, lignumvitæ, lancewood, ebony, box, granadilla, mahogany, rosewood, satinwood, and all other cabinet woods not further manufactured than sawed, fifteen per centum ad valorem; veneers of wood and wood unmanufactured, not specially provided for in this act, twenty per centum ad valorem.

221. Pine clapboards, one dollar per one thousand.

222. Spruce clapboards, one dollar and fifty cents per one thousand.

223. Hubs for wheels, posts, last-blocks, wagon-blocks, oar-blocks, gun-blocks, heading-blocks, and all like blocks or sticks, rough hewn or sawed only, twenty per centum ad valorem.

224. Laths, fifteen cents per one thousand pieces.

225. Pickets and palings, ten per centum ad valorem.

226. White pine shingles, twenty cents per one thousand; all other, thirty cents per one thousand.

227. Staves of wood of all kinds, ten per centum ad valorem.

228. Casks and barrels (empty), sugar box shooks, and packing boxes and packing box shooks, of wood, not specially provided for in this act, thirty per centum ad valorem.

229. Chair cane, or reeds, wrought or manufactured from rattans or reeds, and whether round, square, or in any other shape, ten per centum ad valorem.

230. House or cabinet furniture or wood, wholly or partly finished, manufactures of wood, or of which wood is the component material of chief value, not specially provided for in this act, thirty-five per centum ad valorem.

Schedule E.—Sugar.

231. That on and after July first, eighteen hundred and ninety-one, and until July first, nineteen hundred and five, there shall be paid, from any moneys in the Treasury not otherwise appropriated, under the provisions of section three thousand six hundred and eighty-nine of the Revised Statutes, to the producer of sugar testing not less than ninety degrees by the polariscope, from beets, sorghum or sugar cane grown within the United States, or from maple sap produced within the United States, a bounty of two cents per pound, and upon such sugar testing less than ninety degrees by the polariscope, and not less than eighty degrees, a bounty of one and three-fourths cents per pound, under such rules and regulations as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall prescribe.

232. The producer of said sugar, to be entitled to said bounty, shall have first filed, prior to July first of each year, with the Commissioner of Internal Revenue, a notice of the place of production, with a general description of the machinery and methods to be employed by him, with an estimate of the amount of sugar proposed to be produced in the current or next ensuing year, including the number of maple trees to be tapped, and an application for license to so produce, to be accompanied by a bond in a penalty, and with sureties to be approved by the Commissioner of Internal Revenue, conditioned that he will faithfully observe all rules and regulations that shall be prescribed for such manufacture and production of sugar

233. The Commissioner of Internal Revenue, upon receiving the application and bond hereinbefore provided for, shall issue to the applicant a license to produce sugar from sorghum, beets or sugar-cane grown within the United States, or from maple sap produced within the United States, at the place and with the machinery and by the methods described in the application; but said license shall not extend beyond one year from date thereof.

234. No bounty shall be paid to any person engaged in refining sugars which have been imported into the United States, or produced in the United States, upon which the bounty herein provided for has already been paid or applied for, nor to any person unless he shall have first been licensed as herein provided, and only upon sugar produced by such person from sorghum, beets or sugar-cane grown within the United States, or from maple sap produced within the United States. The Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall from time to time make all needful rules and regulations for the manufacture of sugar from sorghum, beets or sugar-cane grown within the United States, or from maple sap produced within the United States, and shall, under the direction of the Secretary of the Treasury, exercise supervision and inspection of the manufacture thereof.

235. And for the payment of these bounties the Secretary of the Treasury is authorized to draw warrants on the Treasurer of the United States for such sums as shall be necessary, which sums shall be certified to him by the Commissioner of Internal Revenue, by whom the bounties shall be disbursed, and no bounty shall be allowed or paid to any person licensed as aforesaid in any one year upon any quantity of sugar less than five hundred pounds.

236. That any person who shall knowingly refine or aid in the refining of sugar imported into the United States, or upon which the bounty herein provided for has already been paid or applied for, at the place described in the license issued by the Commissioner of Internal Revenue, and any person not entitled to the bounty herein provided for, who shall apply for or receive the same, shall be guilty of a misdemeanor, and, upon conviction thereof, shall pay a fine not ex-

ceeding five thousand dollars, or be imprisoned for a period not exceeding five years, or both, in the discretion of the court.

237. All sugars above number sixteen Dutch standard in color shall pay a duty of five-tenths of one cent per pound: *Provided*, That all such sugars above number sixteen Dutch standard in color shall pay one-tenth of one cent per pound in addition to the rate herein provided for, when exported from or the product of any country when and so long as such country pays, or shall hereafter pay, directly or indirectly, a bounty on the exportation of any sugar that may be included in this grade which is greater than is paid on raw sugars of a lower saccharine strength; and the Secretary of the Treasury shall prescribe suitable rules and regulations to carry this provision into effect: *And provided further*, That all machinery purchased abroad and erected in a beet sugar factory and used in the production of raw sugar in the United States from beets produced therein shall be admitted duty free until the first day of July, eighteen hundred and ninety-two: *Provided*, That any duty collected on any of the above-described machinery purchased abroad and imported into the United States for the uses above indicated since January first, eighteen hundred and ninety, shall be refunded.

238. Sugar candy, and all confectionery, including chocolate confectionery, made wholly or in part of sugar, valued at twelve cents or less per pound, and on sugars after being refined, when tinctured, colored, or in any way adulterated, five cents per pound.

239. All other confectionery, including chocolate confectionery, not specially provided for in this act, fifty per centum ad valorem.

240. Glucose, or grape sugar, three-fourths of one cent per pound.

241. That the provisions of this act providing terms for the admission of imported sugars and molasses, and for the payment of a bounty on sugars of domestic production, shall take effect on the first day of April, eighteen hundred and ninety-one: *Provided*, That on and after the first day of March, eighteen hundred and ninety-one, and prior to the first day of April, eighteen hundred and ninety-one, sugars not exceeding number sixteen Dutch standard in color may be refined in bond without payment of duty, and such refined sugars may be transported in bond and stored in bonded warehouse at such points of destination as are provided in existing laws relating to the immediate transportation of dutiable goods in bond, under such rules and regulations as shall be prescribed by the Secretary of the Treasury.

Schedule F.—Tobacco and Manufactures of.

242. Leaf tobacco suitable for cigar-wrappers, if not stemmed, two dollars per pound; if stemmed, two dollars and seventy-five cents per pound: *Provided*, That if any portion of any tobacco imported in any bale, box, or package, or in bulk, shall be suitable for cigar-wrappers, the entire quantity of tobacco contained in such bale, box, or package, or bulk, shall be dutiable; if not stemmed, at two dollars per pound; it stemmed, at two dollars and seventy-five cents per pound.

243. All other tobacco in leaf, unmanufactured and not stemmed, thirty-five cents per pound; if stemmed, fifty cents per pound.

244. Tobacco, manufactured, of all descriptions, not specially enumerated or provided for in this act, forty cents per pound.

245. Snuff, and snuff flour, manufactured of tobacco, ground dry, or damp, or pickled, scented, or otherwise, of all descriptions, fifty cents per pound.

246. Cigars, cigarettes, and cheroots of all kinds, four dollars and fifty cents per pound, and twenty-five per centum ad valorem; and paper cigars and cigarettes, including wrappers, shall be subject to the same duties as herein imposed upon cigars.

Schedule G.—Agricultural Products and Provisions.

ANIMALS, LIVE. **247.** Horses and mules, thirty dollars per head: *Provided*, That horses valued at one hundred and fifty dollars and over shall pay a duty of thirty per centum ad valorem.

248. Cattle, more than one year old, ten dollars per head; one year old or less, two dollars per head.

249. Hogs, one dollar and fifty cents per head.

250. Sheep, one year old or more, one dollar and fifty cents per head; less than one year old, seventy-five cents per head.

251. All other live animals, not specially provided for in this act, twenty per centum ad valorem.

BREADSTUFFS AND FARINACEOUS SUBSTANCES. **252.** Barley, thirty cents per bushel of forty-eight pounds.

253. Barley-malt, forty-five cents per bushel of thirty-four pounds.

254. Barley, pearled, patent, or hulled, two cents per pound.

255. Buckwheat, fifteen cents per bushel of forty-eight pounds.

256. Corn or maize, fifteen cents per bushel of fifty-six pounds.

257. Corn-meal, twenty cents per bushel of forty-eight pounds.

258. Macaroni, vermicelli, and all similar preparations, two cents per pound.

259. Oats, fifteen cents per bushel.

260. Oatmeal, one cent per pound.

261. Rice, cleaned, two cents per pound; uncleaned rice, one and one-quarter cents per pound; paddy, three-quarters of one cent per pound; rice flour, rice meal, and rice broken, which will pass through a sieve known commercially as number twelve wire sieve, one-fourth of one cent per pound.

262. Rye, ten cents per bushel.

263. Rye flour, one-half of one cent per pound.

264. Wheat, twenty-five cents per bushel.

265. Wheat flour, twenty-five per centum ad valorem.

DAIRY PRODUCTS. **266.** Butter, and substitutes therefor, six cents per pound,

267. Cheese, six cents per pound.

268. Milk, fresh, five cents per gallon.

269. Milk, preserved or condensed, including weight of packages, three cents per pound; sugar of milk, eight cents per pound.

FARM AND FIELD PRODUCTS. **270.** Beans, forty cents per bushel of sixty pounds.

271. Beans, pease, and mushrooms, prepared or preserved, in tins, jars, bottles, or otherwise, forty per centum ad valorem.

272. Broom-corn, eight dollars per ton.

273. Cabbages, three cents each.

274. Cider, five cents per gallon.

275. Eggs, five cents per dozen.

276. Eggs, yolk of, twenty-five per centum ad valorem.

277. Hay, four dollars per ton.

278. Honey, twenty cents per gallon.

279. Hops, fifteen cents per pound.

280. Onions, forty cents per bushel.

281. Pease, green, in bulk, or in barrels, sacks, or similar packages, forty cents per bushel of sixty pounds; pease, dried, twenty cents per bushel; split pease, fifty cents per bushel of sixty pounds; pease in cartons, papers, or other small packages, one cent per pound.

282. Plants, trees, shrubs, and vines of all kinds, commonly known as nursery stock, not specially provided for in this act, twenty per centum ad valorem.

283. Potatoes, twenty-five cents per bushel of sixty pounds.

SEEDS. **284.** Castor beans or seeds, fifty cents per bushel of fifty pounds.

285. Flaxseed or linseed, poppy seed and other oil seeds, not specially provided for in this act, thirty cents per bushel of fifty-six pounds; but no drawback shall be allowed on oil-cake made from imported seed.

286. Garden seeds, agricultural seeds, and other seeds, not specially provided for in this act, twenty per centum ad valorem.

287. Vegetables of all kinds, prepared or preserved, including pickles and sauces of all kinds, not specially provided for in this act, forty-five per centum ad valorem.

288. Vegetables in their natural state, not specially provided for in this act, twenty-five per centum ad valorem.

289. Straw, thirty per centum ad valorem.

290. Teazles, thirty per centum ad valorem.

FISH. **291.** Anchovies and sardines, packed in oil, or otherwise, in tin boxes measuring not more than five inches long, four inches wide, and three and one-half inches deep, ten cents per whole box; in half boxes, measuring not more than five inches long, four inches wide, and one and five-eighths inches deep, five cents each; in quarter-boxes, measuring not more than four and three-fourths inches long, three and one-half inches wide, and one and one-fourth inches deep, two and one-half cents each; when imported in any other form, forty per centum ad valorem.

292. Fish, pickled, in barrels or half-barrels, and mackerel or salmon, pickled or salted, one cent per pound.

293. Fish, smoked, dried, salted, pickled, frozen, packed in ice, or otherwise prepared for preservation, and fresh fish, not specially provided for in this act, three-fourths of one cent per pound.

294. Herrings, pickled or salted, one-half of one cent per pound: herrings, fresh, one-fourth of one cent per pound.

295. Fish in cans or packages made of tin or other material, except anchovies and sardines and fish packed in any other manner, not specially enumerated or provided for in this act, thirty per centum ad valorem.

296. Cans or packages made of tin or other metal, containing shell fish admitted free of duty, not exceeding one quart in contents, shall be subject to a duty of eight cents per dozen cans or packages, and, when exceeding one quart, shall be subject to an additional duty of four cents per dozen for each additional half quart or fractional part thereof: *Provided*, That until June thirtieth, eighteen hundred and ninety-one, such cans or packages shall be admitted as now provided by law.

FRUITS AND NUTS. **297.** Fruits: Apples, green or ripe, twenty-five cents per bushel.

298. Apples, dried, desiccated, evaporated or prepared in any manner, and not otherwise provided for in this act, two cents per pound.

299. Grapes, sixty cents per barrel of three cubic feet capacity, or fractional part thereof; plums and prunes, two cents per pound.

300. Figs, two and one-half cents per pound.

301. Oranges, lemons and limes, in packages of capacity of one and one-fourth cubic feet or less, thirteen cents per package; in packages of capacity exceeding one and one-fourth cubic feet and not exceeding two and one-half cubic feet, twenty-five cents per package; in packages of capacity exceeding two and one-half cubic feet and not exceeding five cubic feet, fifty cents per package; in packages of capacity exceeding five cubic feet, for every additional cubic foot or fractional part thereof, ten cents; in bulk, one dollar and fifty cents per one thousand, and in addition thereto a duty of thirty per centum ad valorem upon the boxes or barrels containing such oranges, lemons or limes.

302. Raisins, two and one-half cents per pound.

303. Comfits, sweetmeats and fruits preserved in sugar, sirup, molasses or spirits, not specially provided for in this act, and jellies of all kinds, thirty-five per centum ad valorem.

304. Fruits preserved in their own juices, thirty per centum ad valorem.

305. Orange-peel and lemon-peel, preserved or candied, two cents per pound.

NUTS. **306.** Almonds, not shelled, five cents per pound; clear almonds, shelled, seven and one-half cents per pound.

307. Filberts and walnuts of all kinds, not shelled, three cents per pound; shelled, six cents per pound.

308 Peanuts and ground beans, unshelled, one cent per pound; shelled, one and one-half cents per pound.

309. Nuts of all kinds shelled or unshelled, not specially provided for in this act, one and one-half cents per pound.

MEAT PRODUCTS. **310.** Bacon and hams, five cents per pound.

311. Beef, mutton and pork, two cents per pound.

312. Meats of all kinds, prepared or preserved, not specially provided for in this act, twenty-five per centum ad valorem.

313. Extracts of meat, all not specially provided for in this act, thirty-five cents per pound; fluid extract of meat, fifteen cents per pound, and no separate or additional duty shall be collected on such coverings, unless as such they are suitable and apparently designed for use other than in the importation of meat extracts.

314. Lard, two cents per pound.

315. Poultry, live, three cents per pound; dressed, five cents per pound.

316. Tallow, one cent per pound; wool grease, including that known commercially as degras, or brown wool grease, one-half of one cent per pound.

317. Chicory-root, burnt or roasted, ground or granulated, or in rolls, or otherwise prepared, and not specially provided for in this act, two cents per pound.

318. Chocolate (other than chocolate confectionery and chocolate commercially known as sweetened chocolate), two cents per pound.

319. Cocoa, prepared or manufactured, not specially provided for in this act, two cents per pound.

320. Cocoa-butter, or cocoa-butterine, three and one-half cents per pound.

321. Dandelion-root and acorns prepared, and other articles used as coffee, or as substitutes for coffee, not specially provided for in this act, one and one-half cents per pound.

SALT. **322.** Salt, in bags, sacks, barrels, or other packages, twelve cents per one hundred pounds; in bulk, eight cents per one hundred pounds: *Provided*, That imported salt in bond may be used in curing fish taken by vessels licensed to engage in the fisheries, and in curing fish on the shores of the navigable waters of the United States, under such regulations as the Secretary of the Treasury shall prescribe, and upon proof that the salt has been used for either of the purposes stated in this proviso, the duties on the same shall be remitted: *Provided further*, That exporters of meats, whether packed or smoked, which have been cured in the United States with imported salt, shall, upon satisfactory proof, under such regulations as the Secretary of the Treasury shall prescribe, that such meats have been cured with imported salt, have refunded to them from the Treasury the duties paid on the salt so used in curing such exported meats, in amounts not less than one hundred dollars.

323. Starch, including all preparations, from whatever substance produced, fit for use as starch, two cents per pound.

324. Dextrine, burnt starch, gum substitute, or British gum, one and one-half cents per pound.

325. Mustard, ground or preserved, in bottles or otherwise, ten cents per pound.

326. Spices, ground or powdered, not specially provided for in this act, four cents per pound; cayenne pepper, two and one-half cents per pound, unground; sage, three cents per pound.

327. Vinegar, seven and one-half cents per gallon. The standard for vinegar shall be taken to be that strength which requires thirty-five grains of bicarbonate of potash to neutralize one ounce troy of vinegar.

328. There shall be allowed on the imported tin-plate used in the manufacture of cans, boxes, packages, and all articles of tin ware exported, either empty or filled with domestic products, a drawback equal to the duty paid on such tin-plate, less one per centum of such duty, which shall be retained for the use of the United States.

Schedule H.—Spirits, Wines and Other Beverages.

SPIRITS. **329.** Brandy and other spirits, manufactured or distilled from grain or other materials, and not specially provided for in this act, two dollars and fifty cents per proof gallon.

330. Each and every gauge or wine gallon of measurement shall be counted as

at least one proof gallon; and the standard for determining the proof of brandy and other spirits or liquors of any kind imported shall be the same as that which is defined in the laws relating to internal revenue; but any brandy or other spirituous liquors, imported in casks of less capacity than fourteen gallons, shall be forfeited to the United States: *Provided*, That it shall be lawful for the Secretary, in his discretion, to authorize the ascertainment of the proof of wines, cordials, or other liquors, by distillation or otherwise, in cases where it is impracticable to ascertain such proof by the means prescribed by existing law or regulations.

331. On all compounds or preparations of which distilled spirits are a component part of chief value, not specially provided for in this act, there shall be levied a duty not less than that imposed upon distilled spirits.

332. Cordials, liquors, arrack, absinthe, kirschwasser, ratafia, and other spirituous beverages or bitters of all kinds containing spirits, and not specially provided for in this act, two dollars and fifty cents per proof gallon.

333. No lower rate or amount of duty shall be levied, collected, and paid on brandy, spirits, and other spirituous beverages than that fixed by law for the description of first proof; but it shall be increased in proportion for any greater strength than the strength of first proof, and all imitations of brandy or spirits or wines imported, by any names whatever, shall be subject to the highest rate of duty provided for the genuine article respectively intended to be represented, and in no case less than one dollar and fifty cents per gallon.

334. Bay-rum or bay-water, whether distilled or compounded, of first proof, and in proportion for any greater strength than first proof, one dollar and fifty cents per gallon.

WINES. **335.** Champagne and all other sparkling wines, in bottles containing each not more than one quart, and more than one pint, eight dollars per dozen; containing not more than one pint each, and more than one-half pint, four dollars per dozen; containing one-half pint each, or less, two dollars per dozen; in bottles or other vessels containing more than one quart each, in addition to eight dollars per dozen bottles, on the quantity in excess of one quart at the rate of two dollars and fifty cents per gallon.

336. Still wines, including ginger wine or ginger cordial and vermuth, in casks, fifty cents per gallon; in bottles or jugs, per case of one dozen bottles or jugs, containing each not more than one quart, and more than one pint, or twenty-four bottles or jugs containing each not more than one pint, one dollar and sixty cents per case; and any excess beyond these quantities found in such bottles or jugs shall be subject to a duty of five cents per pint, or fractional part thereof, but no separate or additional duty shall be assessed on the bottles or jugs: *Provided*, That any wines, ginger cordial, or vermuth imported containing more than twenty-four per centum of alcohol shall be forfeited to the United States: *And provided further*, That there shall be no constructive or other allowance for breakage, leakage, or damage on wines, liquors, cordials, or distilled spirits. Wines, cordials, brandy, and other spirituous liquors imported in bottles or jugs shall be packed in packages containing not less than one dozen bottles or jugs in each package; and all such bottles or jugs shall pay an additional duty of three cents for each bottle or jug unless specially provided for in this act.

337. Ale, porter, and beer, in bottles or jugs, forty cents per gallon, but no separate or additional duty shall be assessed on the bottles or jugs; otherwise than in bottles or jugs, twenty cents per gallon.

338. Malt extract, fluid, in casks, twenty cents per gallon; in bottles or jugs, forty cents per gallon; solid or condensed, forty per centum ad valorem.

339. Cherry juice and prune juice, or prune wine, and other fruit juice, not specially provided for in this act, containing not more than eighteen per centum of alcohol, sixty cents per gallon; if containing more than eighteen per centum of alcohol, two dollars and fifty cents per proof gallon.

340. Ginger-ale, ginger-beer, lemonade, soda-water, and other similar waters in plain green or colored molded or pressed glass bottles, containing each not more than three-fourths of a pint, thirteen cents per dozen; containing more than three-fourths of a pint each and not more than one and one-half pints, twenty-six cents per dozen; but no separate or additional duty shall be assessed on the bot-

tles; if imported otherwise than in plain green or colored molded or pressed glass bottles, or in such bottles containing more than one and one-half pints each, fifty cents per gallon, and in addition thereto, duty shall be collected on the bottles, or other coverings, at the rates which would be chargeable thereon if imported empty.

341. All mineral waters, and all imitations of natural mineral waters, and all artificial mineral waters not specially provided for in this act, in plain green or colored glass bottles, containing not more than one pint, sixteen cents per dozen bottles. If containing more than one pint and not more than one quart, twenty-five cents per dozen bottles. But no separate duty shall be assessed upon the bottles. If imported otherwise than in plain green or colored glass bottles, or if imported in such bottles containing more than one quart, twenty cents per gallon, and in addition thereto duty shall be collected upon the bottles or other covering at the same rate that would be charged if imported empty or separately.

Schedule I.—Cotton Manufactures.

342. Cotton thread, yarn, warps, or warp-yarn, whether single or advanced beyond the condition of single, by grouping or twisting two or more single yarns together, whether on beams or in bundles, skeins or cops, or in any other form, except spool-thread of cotton, hereinafter provided for, valued at not exceeding twenty-five cents per pound, ten cents per pound; valued at over twenty-five cents per pound and not exceeding forty cents per pound, eighteen cents per pound; valued at over forty cents per pound and not exceeding fifty cents per pound, twenty-three cents per pound; valued at over fifty cents per pound and not exceeding sixty cents per pound, twenty-eight cents per pound; valued at over sixty cents per pound and not exceeding seventy cents per pound, thirty-three cents per pound; valued at over seventy cents per pound and not exceeding eighty cents per pound, thirty-eight cents per pound; valued at over eighty cents per pound and not exceeding one dollar per pound, forty-eight cents per pound; valued at over one dollar per pound, fifty per centum ad valorem.

343. Spool-thread of cotton, containing on each spool not exceeding one hundred yards of thread, seven cents per dozen; exceeding one hundred yards on each spool, for every additional one hundred yards of thread or fractional part thereof in excess of one hundred yards, seven cents per dozen spools.

344. Cotton cloth not bleached, dyed, colored, stained, painted or printed, and not exceeding fifty threads to the square inch, counting the warp and filling, two cents per square yard; if bleached, two and one-half cents per square yard; if dyed, colored, stained, painted, or printed, four cents per square yard.

345. Cotton cloth not bleached, dyed, colored, stained, painted, or printed, exceeding fifty and not exceeding one hundred threads to the square inch, counting the warp and filling, two and one-fourth cents per square yard; if bleached, three cents per square yard; if dyed, colored, stained, painted, or printed, four cents per square yard: *Provided*, That on all cotton cloth not exceeding one hundred threads to the square inch, counting the warp and filling, not bleached, dyed, colored, stained painted or printed, valued at over six and one-half cents per square yard; bleached, valued at over nine cents per square yard; and dyed, colored stained, painted, or printed, valued at over twelve cents per square yard, there shall be levied, collected, and paid a duty of thirty-five per centum ad valorem.

346. Cotton cloth not bleached, dyed, colored, stained, painted, or printed, exceeding one hundred and not exceeding one hundred and fifty threads to the square inch, counting the warp and filling, three cents per square yard; if bleached, four cents per square yard; if dyed, colored, stained, painted, or printed, five cents per square yard: *Provided*, That on all cotton cloth exceeding one hundred and not exceeding one hundred and fifty threads to the square inch, counting the warp and filling, not bleached, dyed, colored, stained, painted, or printed, valued at over seven and one-half cents per square yard; bleached, valued at over ten cents per square yard; dyed, colored, stained,

painted, or printed, valued at over twelve and one-half cents per square yard, there shall be levied, collected, and paid a duty of forty per centum ad valorem.

347. Cotton cloth not bleached, dyed, colored, stained, painted, or printed, exceeding one hundred and fifty and not exceeding two hundred threads to the square inch, counting the warp and filling, three and a half cents per square yard; if bleached, four and one-half cents per square yard; if dyed, colored, stained, painted, or printed, five and one-half cents per square yard: *Provided*, That on all cotton cloth exceeding one hundred and fifty and not exceeding two hundred threads to the square inch, counting the warp and filling, not bleached, dyed, colored, stained, painted, or printed, valued at over eight cents per square yard; bleached, valued at over ten cents per square yard; dyed, colored, stained, painted, or printed, valued at over twelve cents per square yard, there shall be levied, collected, and paid a duty of forty-five per centum ad valorem.

348. Cotton cloth not bleached, dyed, colored, stained, painted, or printed, exceeding two hundred threads to the square inch, counting the warp and filling, four and one-half cents per square yard; if bleached, five and one-half cents per square yard; if dyed, colored, stained, painted, or printed, six and three-fourths cents per square yard: *Provided*, That on all such cotton cloths not bleached, dyed, colored, stained, painted, or printed, valued at over ten cents per square yard; bleached, valued at over twelve cents per square yard, and dyed, colored, stained, painted or printed, valued at over fifteen cents per square yard, there shall be levied, collected, and paid a duty of forty-five per centum ad valorem: *Provided further*, That on cotton cloth, bleached, dyed, colored, stained, painted, or printed, containing an admixture of silk, and not otherwise provided for, there shall be levied, collected, and paid a duty of ten cents per square yard, and in addition thereto thirty-five per centum ad valorem.

349. Clothing ready made, and articles of wearing apparel of every description, handkerchiefs, and neckties or neck wear, composed of cotton or other vegetable fiber, or of which cotton or other vegetable fiber is the component material of chief value, made up or manufactured wholly or in part by the tailor, seamstress or manufacturer; all of the foregoing not specially provided for in this act, fifty per centum ad valorem.

Provided, That all such clothing ready made and articles of wearing apparel having India rubber as a component material (not including gloves or elastic articles that are specially provided for in this act), shall be subject to a duty of fifty cents per pound, and in addition thereto fifty per centum ad valorem.

350. Plushes, velvets, velveteens, corduroys and all pile fabrics composed of cotton or other vegetable fiber, not bleached, dyed, colored, stained, painted, or printed, ten cents per square yard and twenty per centum ad valorem; on all such goods if bleached, twelve cents per square yard and twenty per centum ad valorem; if dyed, colored, stained, painted, or printed, fourteen cents per square yard and twenty per centum ad valorem; but none of the foregoing articles in this paragraph shall pay a less rate of duty than forty per centum ad valorem.

351. Chenille curtains, table covers, and all goods manufactured of cotton chenille, or of which cotton chenille forms the component material of chief value, sixty per centum ad valorem.

352. Stockings, hose and half-hose, made on knitting machines or frames, composed of cotton or other vegetable fiber, and not otherwise specially provided for in this act, and shirts and drawers composed of cotton, valued at not more than one dollar and fifty cents per dozen, thirty-five per centum ad valorem.

353. Stockings, hose, and half-hose selvedged, fashioned, narrowed, or shaped wholly or in part by knitting machines or frames, or knit by hand, including such as are commercially known as seamless stockings, hose or half-hose, all of the above composed of cotton or other vegetable fiber, finished or unfinished, valued at not more than sixty cents per dozen pairs, twenty cents per dozen pairs, and in addition thereto twenty per centum ad valorem; valued at more than sixty cents per dozen pairs and not more than two dollars per dozen pairs, fifty cents per dozen pairs, and in addition thereto thirty per centum ad valorem; valued at more than two dollars per dozen pairs and not more than four dollars per dozen pairs,

seventy-five cents per dozen pairs, and in addition thereto forty per centum ad valorem; valued at more than four dollars per dozen pairs, one dollar per dozen pairs, and in addition thereto forty per centum ad valorem; and all shirts and drawers composed of cotton or other vegetable fiber, valued at more than one dollar and fifty cents per dozen and not more than three dollars per dozen, one dollar per dozen, and in addition thereto thirty-five per centum ad valorem; valued at more than three dollars per dozen and not more than five dollars per dozen, one dollar and twenty-five cents per dozen, and in addition thereto forty per centum ad valorem; valued at more than five dollars per dozen and not more than seven dollars per dozen, one dollar and fifty cents per dozen, and in addition thereto forty per centum ad valorem; valued at more than seven dollars per dozen, two dollars per dozen, and in addition thereto forty per centum ad valorem.

354. Cotton cords, braids, boot, shoe, and corset lacings, thirty-five cents per pound; cotton gimps, galloons, webbing, goring, suspenders, and braces, any of the foregoing which are elastic or non-elastic, forty per centum ad valorem: *Provided*, That none of the articles included in this paragraph shall pay a less rate of duty than forty per centum ad valorem.

355. Cotton damask, in the piece or otherwise, and all manufactures of cotton, not specially provided for in this act, forty per centum ad valorem.

Schedule J.—Flax, Hemp, and Jute, and Manufactures of.

356. Flax straw, five dollars per ton.

357. Flax, not hackled or dressed, one cent per pound.

358. Flax, hackled, known as "dressed line," three cents per pound.

359. Tow, of flax or hemp, one-half of one cent per pound.

360. Hemp, twenty-five dollars per ton; hemp, hackled, known as line of hemp, fifty dollars per ton.

361. Yarn, made of jute, thirty-five per centum ad valorem.

362. Cables, cordage and twine (except binding twine, composed wholly of istle or Tampico fiber, manilla, sisal grass or sunn), one and one-half cents per pound; all binding twine manufactured in whole or in part from istle or Tampico fiber, manilla, sisal grass, or sunn, seven-tenths of one cent per pound; cables and cordage made of hemp, two and one-half cents per pound; tarred cables and cordage, three cents per pound.

363. Hemp and jute carpets and carpetings, six cents per square yard.

364. Burlaps, not exceeding sixty inches in width, of flax, jute or hemp, or of which flax, jute or hemp, or either of them, shall be the component material of chief value (except such as may be suitable for bagging for cotton), one and five-eighths cents per pound.

365. Bags for grain made of burlaps, two cents per pound.

366. Bagging for cotton, gunny cloth, and all similar material suitable for covering cotton, composed in whole or in part of hemp, flax, jute, or jute butts, valued at six cents or less per square yard, one and six-tenths cents per square yard; valued at more than six cents per square yard, one and eight-tenths cents per square yard.

367. Flax gill-netting, nets, webs and seines, when the thread or twine of which they are composed is made of yarn of a number not higher than twenty, fifteen cents per pound and thirty-five per centum ad valorem; when made of threads or twines, the yarn of which is finer than number twenty, twenty cents per pound, and in addition thereto forty-five per centum ad valorem.

368. Linen hydraulic hose, made in whole or in part of flax, hemp or jute, twenty cents per pound.

369. Oil cloth for floors, stamped, painted or printed, including linoleum, corticene, cork-carpets, figured or plain, and all other oil cloth (except silk oil cloth), and water-proof cloth, not specially provided for in this act, valued at twenty-five cents or less per square yard, forty per centum ad valorem; valued above twenty-five cents per square yard, fifteen cents per square yard and thirty per centum ad valorem.

370. Yarns or threads composed of flax or hemp, or of a mixture of either of these substances, valued at thirteen cents or less per pound, six cents per pound; valued at more than thirteen cents per pound, forty-five per centum ad valorem.

371. All manufactures of flax or hemp, or of which these substances, or either of them, is the component material of chief value, not especially provided for in this act, fifty per centum ad valorem: *Provided*, That until January first, eighteen hundred and ninety-four, such manufactures of flax containing more than one hundred threads to the square inch, counting both warp and filling, shall be subject to a duty of thirty-five per centum ad valorem in lieu of the duty herein provided.

372. Collars and cuffs, composed entirely of cotton, fifteen cents per dozen pieces and thirty-five per centum ad valorem; composed in whole or in part of linen, thirty cents per dozen pieces and forty per centum ad valorem; shirts and all articles of wearing apparel of every description, not especially provided for in this act, composed wholly or in part of linen, fifty-five per centum ad valorem.

373. Laces, edgings, embroideries, insertings, neck rufflings, ruchings, trimmings, tuckings, lace window-curtains, and other similar tamboured articles, and articles embroidered by hand or machinery, embroidered and hem-stiched handkerchiefs, and articles made wholly or in part of lace, rufflings, tuckings or ruchings, all of the above named articles, composed of flax, jute, cotton or other vegetable fiber, or of which these substances, or either of them, or a mixture of any of them, is the component material of chief value, not specially provided for in this act, sixty per centum ad valorem: *Provided*, That articles of wearing apparel and textile fabrics, when embroidered by hand or machinery, and whether specially or otherwise provided for in this act, shall not pay a less rate of duty than that fixed by the respective paragraphs and schedules of this act upon embroideries of the materials of which they are respectively composed.

374. All manufactures of jute, or other vegetable fiber, except flax, hemp or cotton, or of which jute or other vegetable fiber, except flax, hemp or cotton is the component material of chief value, not specially provided for in this act, valued at five cents per pound or less, two cents per pound; valued above five cents per pound forty per centum ad valorem.

Schedule K.—Wool and Manufactures of Wool.

375. All wools, hair of the camel, goat, alpaca and other like animals shall be divided for the purpose of fixing the duties to be charged thereon into the three following classes:

376. Class one, that is to say, Merino, mestiza, metz or metis wools, or other wools of Merino blood, immediate or remote, Down clothing wools, and wools of like character with any of the preceding, including such as have been heretofore usually imported into the United States from Buenos Ayres, New Zealand, Australia, Cape of Good Hope, Russia, Great Britain, Canada and elsewhere, and also including all wools not hereinafter described or designed in classes two and three.

377. Class two, that is to say, Leicester, Cotswold, Lincolnshire, Down combing wools, Canada long wools, or other like combing, wools of English blood, and usually known by the terms herein used, and also hair of the camel, goat, alpaca and other like animals.

378. Class three, that is to say, Donskoi, native South America, Cordova, Valparaiso, native Smyrna, Russian camel's hair, and including all such wools of like character as have been heretofore usually imported into the United States from Turkey, Greece, Egypt, Syria and elsewhere, excepting improved wools hereinafter provided for.

379. The standard samples of all wools which are now or may be hereafter deposited in the principal custom houses of the United States, under the authority of the Secretary of the Treasury, shall be the standards for the classification of wools under this act, and the Secretary of the Treasury shall have the authority to renew these standards, and to make such additions to them from time to

time as may be required, and he shall cause to be deposited like standards in other custom houses of the United States when they may be needed.

380. Whenever wools of class three shall have been improved by the admixture of Merino or English blood from their present character, as represented by the standard samples now or hereafter to be deposited in the principal custom houses of the United States, such improved wools shall be classified for duty either as class one or class two, as the case may be.

381. The duty on wools of the first class which shall be imported washed shall be twice the amount of the duty to which they would be subjected if imported unwashed, and the duty on wools of the first and second classes which shall be imported scoured shall be three times the duty to which they would be subjected if imported unwashed.

382. Unwashed wools shall be considered such as shall have been shorn from the sheep without any cleansing; that is, in their natural condition. Washed wools shall be considered such as have been washed with water on the sheep's back. Wool washed in any other manner than on the sheep's back shall be considered as scoured wool.

383. The duty upon wool of the sheep, or hair of the camel, goat, alpaca and other like animals which shall be imported in any other than ordinary condition, or which shall be changed in its character or condition for the purpose of evading the duty, or which shall be reduced in value by the admixture of dirt or any other foreign substance, or which has been sorted or increased in value by the rejection of any part of the original fleece, shall be twice the duty to which it would be otherwise subject: *Provided*, That skirted wools as now imported are hereby excepted. Wools on which a duty is assessed amounting to three times or more than that which would be assessed if said wool was imported unwashed, such duty shall not be doubled on account of its being sorted If any bale or package of wool or hair specified in this act imported as of any specified class, or claimed by the importer to be dutiable as of any specified class, shall contain any wool or hair subject to a higher rate of duty than the class so specified, the whole bale or package shall be subject to the highest rate of duty chargeable on wool of the class subject to such higher rate of duty, and if any bale or package be claimed by the importer to be shoddy, mungo, flocks, wool, hair or other material of any class specified in this act, and such bale contain any admixture of any one or more of said materials, or of any other material, the whole bale or package shall be subject to duty at the highest rate imposed upon any article in said bale or package.

384. The duty upon all wools and hair of the first class shall be eleven cents per pound, and upon all wools or hair of the second class, twelve cents per pound.

385. On wools of the third class, and on camel's hair of the third class the value whereof shall be thirteen cents or less per pound, including charges, the duty shall be thirty-two per centum ad valorem.

386. On wools of the third class, and on camel's hair of the third class, the value whereof shall exceed thirteen cents per pound, including charges, the duty shall be fifty per centum ad valorem.

387. Wools on the skin shall pay the same rate as other wools, the quantity and value to be ascertained under such rules as the Secretary of the Treasury may prescribe.

388. On noils, shoddy, top waste, slubbing waste, roving waste, ring waste, yarn waste, garnetted waste, and all other wastes composed wholly or in part of wool, the duty shall be thirty cents per pound.

389. On woolen rags, mungo and flocks the duty shall be ten cents per pound.

390. Wools and hair of the camel, goat, alpaca or other like animals, in the form of roping, roving or tops, and all wool and hair which has been advanced in any manner or by any process of manufacture beyond the washed or scoured condition, not specially provided for in this act, shall be subject to the same duties as are imposed upon manufactures of wool not specially provided for in this act.

391. On woolen and worsted yarns made wholly or in part of wool, worsted,

the hair of the camel, goat, alpaca, or other animals, valued at not more than thirty cents per pound, the duty per pound shall be two and one-half times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto, thirty-five per centum ad valorem; valued at more than thirty cents and not more than forty cents per pound, the duty per pound shall be three times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto thirty-five per centum ad valorem; valued at more than forty cents per pound, the duty per pound shall be three and one-half times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto forty per centum ad valorem.

392. On woolen or worsted cloths, shawls, knit fabrics, and all fabrics made on knitting machines or frames, and all manufactures of every description made wholly or in part of wool, worsted, the hair of the camel, goat, alpaca, or other animals, not specially provided for in this act, valued at not more than thirty cents per pound, the duty per pound shall be three times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto forty per centum ad valorem; valued at more than thirty and not more than forty cents per pound, the duty per pound shall be three and one-half times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto forty per centum ad valorem; valued at above forty cents per pound, the duty per pound shall be four times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto fifty per centum ad valorem.

393. On blankets, hats of wool, and flannels for underwear, composed wholly or in part of wool, the hair of the camel, goat, alpaca, or other animals, valued at not more thirty cents per pound, the duty per pound shall be the same as the duty imposed by this act on one pound and one-half of unwashed wool of the first class, and in addition thereto thirty per centum ad valorem; valued at more than thirty and not more than forty cents per pound, the duty per pound shall be twice the duty imposed by this act on a pound of unwashed wool of the first class, valued at more than forty cents and not more than fifty cents per pound, the duty per pound shall be three times the duty imposed by this act on a pound of unwashed wool of the first class; and in addition thereto upon all the above-named articles thirty-five per centum ad valorem. On blankets and hats of wool composed wholly or in part of wool, the hair of the camel, goat, alpaca, or other animals, valued at more than fifty cents per pound, the duty per pound shall be three and a half times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto forty per centum ad valorem. Flannels composed wholly or in part of wool, the hair of the camel, goat, alpaca, or other animals, valued at above fifty cents per pound shall be classified and pay the same duty as women's and children's dress goods, coat lining, Italian cloths, and goods of similar character and description provided by this act.

394. On women's and children's dress goods, coat linings, Italian cloths, and goods of similar character or description of which the warp consists wholly of cotton or other vegetable material, with the remainder of the fabric composed wholly or in part of wool, worsted, the hair of the camel, goat, alpaca, or other animals, valued at not exceeding fifteen cents per square yard, seven cents per square yard, and in addition thereto forty per centum ad valorem; valued at above fifteen cents per square yard, eight cents per square yard, and in addition thereto fifty per centum ad valorem. *Provided*, That on all such goods weighing over four ounces per square yard the duty per pound shall be four times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto fifty per centum ad valorem.

395. On women's and children's dress goods, coat linings, Italian cloth, bunting, and goods of similar description or character composed wholly or in part of wool, worsted, the hair of the camel, goat, alpaca, or other animals, and not specially provided for in this act, the duty shall be twelve cents per square yard, and in addition thereto fifty per centum ad valorem: *Provided*, That on all such goods weighing over four ounces per square yard the duty per pound

shall be four times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto fifty per centum ad valorem.

396. On clothing ready made, and articles of wearing apparel of every description, made up or manufactured wholly or in part, not specially provided for in this act, felts not woven and not specially provided for in this act, and plushes, and other pile fabrics, all the foregoing, composed wholly or in part of wool, worsted, the hair of the camel, goat, alpaca, or other animals, the duty per pound shall be four and one-half times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto sixty per centum ad valorem.

397. On cloaks, dolmans, jackets, talmas, ulsters or other outside garments for ladies' and children's apparel, and goods of similar description, or used for like purposes, composed wholly or in part of wool, worsted, the hair of the camel, goat, alpaca, or other animals, made up or manufactured wholly or in part, the duty per pound shall be four and one-half times the duty imposed by this act on a pound of unwashed wool of the first class, and in addition thereto sixty per centum ad valorem.

398. On webbings, gorings, suspenders, braces, beltings, bindings, braids, galloons, fringes, gimps, cords, cords and tassels, dress trimmings, laces and embroideries, head nets, buttons, or barrel buttons, or buttons of other forms, for tassels or ornaments, wrought by hand or braided by machinery, any of the foregoing which are elastic or non-elastic, made of wool, worsted, the hair of the camel, goat, alpaca, or other animals, or of which wool, worsted, the hair of the camel, goat, alpaca, or other animals is a component material, the duty shall be sixty cents per pound, and in addition thereto sixty per centum ad valorem.

399. Aubusson, Axminster, Moquette, and Chenille carpets, figured or plain, carpets woven whole for rooms, and all carpets or carpeting of like character or description, and Oriental, Berlin, and other similar rugs, sixty cents per square yard, and in addition thereto forty per centum ad valorem.

400. Saxony, Wilton, and Tournay velvet carpets, figured or plain, and all carpets or carpeting of like character or description, sixty cents per square yard, and in addition thereto forty per centum ad valorem.

401. Brussels carpets, figured or plain, and all carpets or carpeting of like character or description, forty-four cents per square yard, and in addition thereto forty per centum ad valorem.

402. Velvet and tapestry velvet carpets, figured or plain, printed on the warp or otherwise, and all carpets or carpeting of like character or description, forty cents per square yard, and in addition thereto forty per centum ad valorem.

403. Tapestry Brussels carpets, figured or plain, and all carpets or carpeting of like character or description, printed on the warp or otherwise, twenty-eight cents per square yard, and in addition thereto forty per centum ad valorem.

404. Treble ingrain, three-ply and all chain Venetian carpets, nineteen cents per square yard, and in addition thereto forty per centum ad valorem.

405. Wool Dutch and two-ply ingrain carpets, fourteen cents per square yard, and in addition thereto forty per centum ad valorem.

406. Druggets and bockings, printed, colored, or otherwise, twenty-two cents per square yard, and in addition thereto forty per centum ad valorem. Felt carpeting, figured or plain, eleven cents per square yard, and in addition thereto forty per centum ad valorem.

407. Carpets and carpeting of wool, flax or cotton, or composed in part of either, not specially provided for in this act, fifty per centum ad valorem.

408. Mats, rugs; screens, covers, hassocks, bed sides, art squares, and other portions of carpets or carpeting made wholly or in part of wool, and not specially provided for in this act, shall be subjected to the rate of duty herein imposed on carpets or carpeting of like character or description.

Schedule L.—Silk and Silk Goods.

409. Silk partially manufactured from cocoons or from waste silk, and not further advanced or manufactured than carded or combed silk, fifty cents per pound.

410. Thrown silk, not more advanced than singles, tram, organzine, sewing silk, twist, floss, and silk threads or yarns of every description except spun silk, thirty per centum ad valorem; spun silk in skeins or cops or on beams, thirty-five per centum ad valorem.

411. Valvets, plushes, or other pile fabrics, containing, exclusive of selvedges, less than seventy-five per centum in weight of silk, one dollar and fifty cents per pound and fifteen per centum ad valorem; containing, exclusive of selvedges, seventy-five per centum or more in weight of silk, three dollars and fifty cents per pound, and fifteen per centum ad valorem; but in no case shall any of the foregoing articles pay a less rate of duty than fifty per centum ad valorem.

412. Webbings, gorings, suspenders, braces, beltings, bindings, braids, galloons, fringes, cords and tassels, any of the foregoing which are elastic or non-elastic, buttons; and ornaments made of silk, or of which silk is the component material of chief value, fifty per centum ad valorem.

413. Laces and embroideries, handkerchiefs, neck rufflings and ruchings, clothing ready-made, and articles of wearing apparel of every description, including knit goods, made up or manufactured wholly or in part by the tailor, seamstress, manufacturer, composed of silk, or of which silk is the component material of chief value, not specially provided for in this act, sixty per centum ad valorem: *Provided*, That all such clothing ready-made and articles of wearing apparel when composed in port of India rubber (not including gloves or elastic articles that are specially provided for in this act), shall be subject to a duty of eight cents per ounce, and in addition thereto sixty per centum ad valorem.

414. All manufactures of silk, or of which silk is the component material of chief value, not specially provided for in this act, fifty per centum ad valorem: *Provided*, That all such manufactures of which wool, or the hair of the camel, goat or other like animals is a component material, shall be classified as manufactures of wool.

Schedule M.--Pulp, Paper and Books.

PULP AND PAPER. **415.** Mechanically ground wood pulp, two dollars and fifty cents per ton dry weight; chemical wood pulp, unbleached, six dollars per ton dry weight; bleached, seven dollars per ton dry weight.

416. Sheating paper, ten per centum ad valorem.

417. Printing paper, unsized, suitable only for books and newspapers, fifteen per centum ad valorem.

418. Printing paper, sized or glued, suitable only for books and newspapers, twenty per centum ad valorem.

419. Paper known commercially as copying paper, filtering paper, silver paper, and all tissue paper, white or colored, made up in copying books, reams, or in any other form, eight cents per pound, and in addition thereto fifteen per centum ad valorem, albumenized or sensitized paper, thirty-five per centum ad valorem.

420. Paper known commercially as surface-coated papers, and manufactures thereof, card-boards, lithographic prints from either stone or zinc, bound or unbound (except illustrations when forming a part of a periodical, newspaper or in printed books accompanying the same), and all articles produced either in whole or in part by lithographic process, and photograph, autograph and scrap albums, wholly or partially manufactured, thirty-five per centum ad valorem.

MANUFACTURES OF PAPER. **421.** Paper envelopes, twenty-five cents per thousand.

422. Paper hangings and paper for screens or fire-boards, writing paper, drawing-paper, and all other paper not specially provided for in this act, twenty-five per centum ad valorem.

423. Books, including blank books of all kinds, pamphlets and engravings, bound or unbound, photographs, etchings, maps, charts, and all printed matter not specially provided for in this act, twenty-five per centum ad valorem.

424. Playing cards, fifty cents per pack.

425. Manufactures of paper, or of which paper is the component material of chief value, not specially provided for in this act, twenty-five per centum ad valorem.

Schedule N.—Sundries.

426. Bristles, ten cents per pound.

427. Brushes and brooms of all kinds, including feather dusters and hair pencils in quills, forty per centum ad valorem.

428. Button forms: Lastings, mohair cloth, silk, or other manufactures of cloth, woven or made in patterns of such size, shape or form, or cut in such manner as to be fit for buttons exclusively, ten per centum ad valorem.

429. Buttons commercially known as Agate buttons, twenty-five per centum ad valorem. Pearl and shell buttons, two and one-half cents per line button measure of one-fortieth of one inch per gross, and in addition thereto twenty-five per centum ad valorem

480. Ivory, vegetable ivory, bone or horn buttons, fifty per centum ad valorem.

431. Shoe-buttons, made of paper, board, papier mache, pulp, or other similar material not especially provided for in this act, valued at not exceeding three cents per gross, one cent per gross.

432. Coal, bituminous, and shale, seventy-five cents per ton of twenty-eight bushels, eighty pounds to the bushel; coal slack or culm, such as will pass through a half-inch screen, thirty cents per ton of twenty-eight bushels, eighty pounds to the bushel.

433. Coke, twenty per centum ad valorem.

434. Cork bark, cut into squares or cubes, ten cents per pound; manufactured corks, fifteen cents per pound.

435. Dice, draughts, chess-men, chess-balls, billiard, pool, and bagatelle balls, of ivory, bone, or other materials, fifty per centum ad valorem.

436. Dolls, doll-heads, toy marbles, of whatever material composed, and all other toys not composed of rubber, china, porcelain, parian, bisque, earthen or stoneware, and not specially provided for in this act, thirty-five per centum ad valorem.

437. Emery grains and emery manufactured, ground, pulverized, or refined, one cent per pound.

EXPLOSIVE SUBSTANCES. **438.** Fire-crackers of all kinds, eight cents per pound, but no allowance shall be made for tare or damage thereon.

439. Fulminates, fulminating powders, and like articles, not specially provided for in this act, thirty per centum ad valorem.

440. Gunpowder, and all explosive substances used for mining, blasting, artillery, or sporting purposes, when valued at twenty cents or less per pound, five cents per pound; valued above twenty cents per pound, eight cents per pound.

441. Matches, friction or lucifer, of all descriptions, per gross of one hundred and forty-four boxes, containing not more than one hundred matches per box, ten cents per gross; when imported otherwise than in boxes containing not more than one hundred matches each, one cent per thousand matches.

442. Percussion-caps, forty per centum ad valorem.

443. Feather and downs of all kinds, crude, or not dressed, colored, or manufactured, not specially provided for in this act, ten per centum ad valorem; when dressed, colored, or manufactured, including quilts of down and other manufactures of down, and also including dressed and finished birds suitable for millinery ornaments, and artificial and ornamental feathers and flowers or parts thereof, of whatever material composed, not specially provided for in this act, fifty per centum ad valorem.

444. Furs, dressed on the skin, but not made up into articles, and furs not on the skin, prepared for hatters' use, twenty per centum ad valorem.

445. Glass beads, loose, unthreaded or unstrung, ten per centum ad valorem.

446. Gun-wads of all descriptions, thirty-five per centum ad valorem.

447. Hair, human, if clean or drawn, but not manufactured, twenty per centum ad valorem.

448. Hair-cloth, known as "crinoline-cloth," eight cents per square yard.

449. Hair-cloth, known as "hair-seating," thirty cents per square yard.

450. Hair, curled, suitable for beds or mattresses, fifteen per centum ad valorem.

451. Hats, for men's, women's and children's wear, composed of the fur of the rabbit, beaver, or other animals, or of which such fur is the component material of chief value, wholly or partially manufactured, including fur hat bodies, fifty-five per centum ad valorem.

JEWELRY AND PRECIOUS STONES. **452.** Jewelry: All articles, not elsewhere specially provided for in this act, composed of precious metals or imitations thereof, whether set with coral, jet, or pearls, or with diamonds, rubys, cameos, or other precious stones, or imitations thereof, or otherwise, and which shall be known commercially as "jewelry," and cameos in frames, fifty per centum ad valorem.

453. Pearls, ten per centum ad valorem.

454. Precious stones of all kinds, cut but not set, ten per centum ad valorem; if set, and not specially provided for in this act, twenty-five per centum ad valorem. Imitation of precious stones, composed of paste or glass, not exceeding one inch in dimensions, not set, ten per centum ad valorem.

LEATHER AND MANUFACTURES OF. **455.** Bend or belting leather and sole leather, and leather not specially provided for in this act, ten per centum ad valorem.

456. Calf skins, tanned, or tanned and dressed, dressed upper leather, including patent, enameled and japanned leather, dressed or undressed, and finished, chamois or other skins not specially enumerated or provided for in this act, twenty per centum ad valorem; bookbinders' calf-skins, kangaroo, sheep and goat skins, including lamb and kid skins, dressed and finished, twenty per centum ad valorem; skins for morocco, tanned but unfinished, ten per centum ad valorem; pianoforte leather and pianoforte action leather, thirty-five per centum ad valorem; boots and shoes, made of leather, twenty-five per centum ad valorem.

457. But leather cut into shoe uppers or vamps, or other forms suitable for conversion into manufactured articles, shall be classified as manufactures of leather, and pay duty accordingly.

458. Gloves of all descriptions, composed wholly or in part of kid or other leather, and whether wholly or partly manufactured, shall pay duty at the rates fixed in connection with the following specified kinds thereof, fourteen inches in extreme length, when stretched to the full extent, being in each case hereby fixed as the standard, and one dozen pairs as the basis, namely: Ladies' and children's schmaschen of said length or under, one dollar and seventy-five cents per dozen; ladies' and children's lamb of said length or under, two dollars and twenty-five cents per dozen; ladies' and children's kid of said length or under, three dollars and twenty-five cents per dozen; ladies' and children's suedes of said length or under, fifty per centum ad valorem; all other ladies' and children's leather gloves, and all men's leather gloves of said length or under, fifty per centum ad valorem; all leather gloves over fourteen inches in length, fifty per centum ad valorem; and in addition to the above rates there shall be paid on all men's gloves one dollar per dozen; on all lined gloves, one dollar per dozen; on pique or prick seam gloves, fifty cents per dozen; on all embroidered gloves with more than three single strands or cords, fifty cents per dozen pairs. *Provided*, That all gloves represented to be of a kind or grade below their actual kind or grade shall pay an additional duty of five dollars per dozen pairs. *Provided further*, That none of the articles named in this paragraph shall pay a less rate of duty than fifty per centum ad valorem.

MISCELLANEOUS MANUFACTURES. **459.** Manufactures of alabaster, amber, asbestos, bladders, coral, cat-gut, or whip-gut or worm-gut, jet, paste, spar, wax, or of which these substances or either of them is the component material of chief value, not specially provided for in this act, twenty-five per centum ad valorem; osier or willow, prepared for basket makers' use, thirty per centum ad valorem; manufactures of osier or willow, forty per centum ad valorem.

460. Manufactures of bone, chip, grass, horn, India-rubber, palm-leaf, straw, weeds or whalebone, or of which these substances or either of them is the component material of chief value, not specially provided for in this act, thirty per centum ad valorem.

461. Manufactures of leather, fur, gutta-percha, vulcanized India-rubber, known as hard rubber, human hair, papier-mache and indurated fiber wares, and other manufactures composed of wood or pulp, or of which these substances or either of them is the component material of chief value, all of the above not specially provided for in this act, thirty-five per centum ad valorem.

462. Manufactures of ivory, vegetable ivory, mother-of-pearl, and shell, or of which these substances or either of them is the component material of chief value, not specially provided for in this act, forty per centum ad valorem.

463. Masks, composed of paper or pulp, thirty-five per centum ad valorem.

464. Matting made of cocoa-fiber or rattan, twelve cents per square yard; mats made of cocoa-fiber or rattan, eight cents per square foot.

465. Paintings, in oil or water colors, and statuary, not otherwise provided for in this act, fifteen per centum ad valorem; but the term "statuary" as herein used shall be understood to include only such statuary as is cut, carved or otherwise wrought by hand from a solid block or mass of marble, stone or alabaster, or from metal, and as is the professional production of a statuary or sculptor only.

466. Pencils of wood filled with lead or other material, and pencils of lead, fifty cents per gross and thirty per centum ad valorem; slate pencils, four cents per gross.

467. Pencil leads, not in wood, ten per centum ad valorem.

PIPES AND SMOKERS' ARTICLES. **468.** Pipes, pipe-bowls, of all materials, and all smokers' articles whatsoever, not specially provided for in this act, including cigarette books, cigarette book-covers, pouches for smoking or chewing tobacco, and cigarette-paper in all forms, seventy-five per centum ad valorem; all common tobacco pipes of clay, fifteen cents per gross.

469. Plush, black, known commercially as hatters' plush, composed of silk, or of silk and cotton, and used exclusively for making men's hats, ten per centum ad valorem.

470. Umbrellas, parasols, and sun-shades, covered with silk or alpaca, fifty-five per centum ad valorem; if covered with other material, forty-five per centum ad valorem.

471. Umbrellas, parasols and sun-shades, sticks for, if plain, finished or unfinished, thirty-five per centum ad valorem; if carved, fifty per centum ad valorem.

472. Waste, not specially provided for in this act, ten per centum ad valorem.

THE FREE LIST.

SEC. 2. On and after the sixth day of October, eighteen hundred and ninety, unless otherwise specially provided for in this act, the following articles when imported shall be exempt from duty.

473. Acids used for medicinal, chemical, or manufacturing purposes, not specially provided for in this act.

474. Aconite.

475. Acorns, raw, dried or undried, but unground.

476. Agates, unmanufactured.

477. Albumen

478. Alizarine, natural or artificial, and dyes commercially known as Alizarine yellow, Alizarine orange, Alizarine green, Alizarine blue, Alizarine brown, Alizarine black.

479. Amber, unmanufactured, or crude gum.

480. Ambergris.

481. Aniline salts.

482. Any animal imported specially for breeding purposes shall be admitted free: *Provided*, That no such animal shall be admitted free unless pure bred of

a recognized breed, and duly registered in the book of record established for that breed; *and Provided further*, That certificate of such record and of the pedigree of such animal shall be produced and admitted to the customs officer, duly authenticated by the proper custodian of such book of record, together with the affidavit of the owner, agent, or importer that such animal is the identical animal described in said certificate of record and pedigree. The Secretary of the Treasury may prescribe such additional regulations as may be required for the strict enforcement of this provision.

483. Animals brought into the United States temporarily for a period not exceeding six months, for the purpose of exhibition or competition for prizes offered by any agricultural or racing association; but a bond shall be given in accordance with regulations prescribed by the Secretary of the Treasury; also, teams of animals, including their harness and tackle and the wagon or other vehicles actually owned by persons emigrating from foreign countries to the United States with their families, and in actual use for the purpose of such emigration, under such regulations as the Secretary of the Treasury may prescribe; and wild animals intended for exhibition in zoological collections for scientific and educational purposes, and not for sale or profit.

484. Annatto, roucou, rocoa, or orleans, and all extracts of.

485. Antimony ore, crude sulphide of.

486. Apatite.

487. Argal, or argol, or crude tartar.

488. Arrowroot, raw or unmanufactured.

489. Arsenic and sulphide of, or orpiment.

490. Arseniate of aniline.

491. Art educational stops composed of glass and metal and valued at not more than six cents per gross.

492. Articles in a crude state used in dyeing or tanning not specially provided for in this act.

493. Articles, the growth, produce and manufacture of the United States, when returned after having been exported, without having been advanced in value or improved in condition by any process of manufacture or other means; casks, barrels, carboys, bags, and other vesssls of American manufacture exported filled with American products, or exported empty and returned filled with foreign products, including shooks when returned as barrels or boxes; also quicksilver flasks or bottles, of either domestic or foreign manufacture, which shall have been actually exported from the United States, but proof of the identity of such articles shall be made, under general regulations to be prescribed by the Secretary of the Treasury; and if any such articles are subject to internal tax at the time of exportation, such tax shall be proved to have been paid before exportation and not refunded: *Provided*, That this paragraph shall not apply to articles upon which an allowance of drawback has been made, the reimportation of which is hereby prohibited except upon payment of duties equal to the drawbacks allowed; or to any article manufactured in bonded-warehouse and exported under any provision of law; *And provided further*, That when manufactured tobacco, which has been exported without payment of internal-revenue tax, shall be reimported, it shall be retained in the custody of the collector of customs until internal-revenue stamps in payment of the legal duties shall be placed thereon,

494. Asbestos, unmanufactured.

495. Ashes, wool and lye of, and beet-root ashes.

496. Asphaltum and bitumen, crude.

497. Asafetida.

498. Balm of Gilead.

499. Barks, cinchona or other from which quinine may be extracted.

500. Baryta, carbonate of, or witherite.

501. Bauxite, or beauxite.

502. Beeswax.

503. Bells, broken, and bell metal broken and fit only to be remanufactured.

504. Birds, stuffed, not suitable for millinery ornaments, and bird skins, prepared for preservation, but not further advanced in manufacture.

505. Birds and land and water fowls.
506. Bismuth.
507. Bladders, including fish-bladders or fish-sounds, crude, and all integuments of animals not specially provided for in this act.
508. Blood, dried.
509. Bologna sausages.
510. Bolting cloths, especially for milling purposes, but not suitable for the manufacture of wearing apparel.
511. Bones, crude, or not burned, calcined, ground, steamed, or otherwise manufactured, and bone-dust or animal carbon, and bone ash, fit only for fertilizing purposes.
512. Books, engravings, photographs, bound or unbound, etchings, maps and charts, which shall have been printed and bound or manufactured more than twenty years at the date of importation.
513. Books and pamphlets printed exclusively in languages other than English; also books and music, in raised print used exclusively by the blind.
514. Books, engravings, photograghs, etchings, bound or unbound, maps and charts imported by authority or for the use of the United States or for the use of the Library of Congress.
515. Books, maps, lithographic prints, and charts, specially imported, not more than two copies in any one invoice, in good faith, for the use of any society incorporated or established for educational, philosophical, literary or religious purposes, or for the encouragement of the fine arts, or for the use or by order of any college, academy, school, or seminary of learning in the United States, subject to such regulations as the Secretary of the Treasury shall prescribe.
516. Books, or libraries, or parts of libraries, and other household effects of persons or families from foreign countries if actually used abroad by them not less than one year, and not intended for any other person or persons, nor for sale.
517. Brazil paste.
518. Braids, plaits, laces, and similar manufactures, composed of straw, chip, grass, palm-leaf, willow, osier, or rattan, suitable for making or ornamenting hats, bonnets, and hoods.
519. Brazilian pebble unwrought or unmanufactured.
520. Breccia, in block or slabs.
521. Bromine.
522. Bullion, gold or silver.
523. Burgundy pitch.
524. Cabinets of old coins and medals, and other collections of antiquities, but the term "antiquities" as used in this act shall include only such articles as are suitable for souvenirs or cabinet collections, and which shall have been produced at any period prior to the year seventeen hundred.
525. Cadmium.
526. Calamine.
527. Camphor, crude.
528. Castor or castoreum.
529. Cat gut, whip gut, or worm gut, unmanufactured, or not further manufactured than in strings or cords.
530. Cerium.
531. Chalk, unmanufactured.
532. Charcoal.
533. Chicory-root, raw, or undried, but unground.
534. Civet, crude.
535. Clay—Common blue clay in casks suitable for the manufacture of crucibles.
536. Coal, anthracite.
537. Coal stores of American vessels; but none shall be unloaded.
538. Coal-tar, crude.
539. Cobalt, and cobalt-ore.
540. Cocculus indicus.
541. Cochineal.

542. Cocoa, or cocao, crude, and fiber, leaves and shells of.
543. Coffee.
544. Coins, gold, silver, and copper.
545. Coir, and coir yarn.
546. Copper, old, taken from the bottom of American vessels compelled by marine disaster to repair in foreign ports.
547. Coral, marine, uncut, and unmanufactured.
548. Cork-wood, or cork-bark, unmanufactured.
549. Cotton, and cotton-waste or flocks.
550. Cryolite, or kryolith.
551. Cuybear.
552. Curling-stones, or quoits, and curling-stone handles.
553. Curry, and curry-powder.
554. Cutch.
555. Cuttle-fish bone.
556. Dandelion roots, raw, dried, or undried, but unground.
557. Diamonds and other precious stones, rough or uncut, including glaziers' and engravers' diamonds not set, and diamond dust or bort, and jewels to be used in the manufacture of watches.
558. Divi-divi.
559. Dragon's blood.
560. Drugs, such as barks, beans, berries, balsams, buds, bulbs, and bulbous roots, excrescences such as nut galls, fruits, flowers, dried insects, grains, gums, and gum-resin, herbs, leaves, lichens, mosses, nuts, roots, and stems, spices, vegetables, seeds aromatic, and seeds of morbid growth, weeds, and wood used expressly for dyeing; any of the foregoing which are not edible and are in a crude state, and not advanced in value or condition by refining or grinding, or by other process of manufacture, and not specially provided for in this act.
561. Eggs of birds, fish and insects.
562. Emery ore.
563. Ergot.
564. Fans, common palm-leaf and palm-leaf unmanufactured.
565. Farina.
566. Fashion-plates, engraved on steel or copper, or on wood, colored or plain.
567. Feathers and downs for beds.
568. Feldspar.
569. Felt, adhesive, for sheathing vessels.
570. Fibrin, in all forms.
571. Fish, the product of American fisheries, and fresh or frozen fish (except salmon) caught in fresh waters by American vessels, or with nets or other devices owned by citizens of the United States.
572. Fish for bait.
573. Fish skins.
574. Flint, flints, and ground flint stones.
575. Floor matting, manufactured from round or split straw, including what is commonly known as Chinese matting.
576. Fossils.
577. Fruit-plants, tropical and semi-tropical, for the purpose of propagation or cultivation.
FRUITS AND NUTS. **578.** Currants, Zante or other.
579. Dates.
580. Fruits, green, ripe or dried, not specially provided for in this act.
581. Tamarinds.
582. Cocoa nuts.
583. Brazil nuts.
584. Cream nuts.
585. Palm nuts.
586. Palm-nut kernels.
587. Furs undressed.
588. Fur-skins of all kinds not dressed in any manner.

589. Gambier.

590. Glass, broken, and old glass, which can not be cut for use, and fit only to be remanufactured.

591. Glass plates or disks, rough-cut or unwrought, for use in the manufacture of optical instruments, spectacles and eye-glasses, and suitable only for such use: *Provided, however,* That such disks exceeding eight inches in diameter may be polished sufficiently to enable the character of the glass to be determined.

GRASSES AND FIBERS. **592.** Istle or Tampico fiber.

593. Jute.

594. Jute butts.

595. Manilla.

596. Sisal-grass.

597. Sunn.

And all other textile grasses or fibrous vegetable substances, unmanufactured or undressed, not specially provided for in this act,

598. Gold beaters' molds and gold beaters' skins.

599. Grease and oils, such as are commonly used in soap-making, or in wire-drawing, or for stuffing or dressing leather, and which are fit only for such uses, not specially provided for in this act.

600. Guano, manures, and all substances expressly used for manure.

601. Gunny bags and gunny cloths, old or refuse, fit only for remanufacture.

602. Guts, salted.

603. Gutta percha, crude.

604. Hair of horse, cattle, and other animals, cleaned or uncleaned, drawn or undrawn, but unmanufactured, not specially provided for in this act; and human hair, raw, uncleaned, and not drawn.

605. Hides, raw or uncured, whether dry, salted, or pickled, Angora goat skins, raw without the wool, unmanufactured, asses' skins, raw or unmanufactured, and skins, except sheep-skins with the wool on.

606. Hide-cuttings, raw, with or without hair, and all other glue-stock.

607. Hide-rope.

608. Hones and whetstones.

609. Hoofs, unmanufactured.

610. Hop roots for cultivation.

611. Horns and parts of, unmanufactured, including horn strips and tips.

612. Ice.

613. India rubber, crude, and milk of, and scraps or refuse Indian rubber which has been worn out by use and is fit only for remanufacture.

614. Indigo.

615. Iodine, crude.

616. Ipecac.

617. Iridium.

618. Ivory and vegetable ivory, not sawed, cut or otherwise manufactured.

619. Jalap.

620. Jet, unmanufactured.

621. Joss-sticks, or Joss-light.

622. Junk, old.

623. Kelp.

624. Kieserite,

625. Kyanite, or cyanite, and kainite

626. Lac-dye, crude, seed, button, stick and shell.

627. Lac spirits.

628. Lactarine.

629. Lava, unmanufactured.

630. Leeches.

631. Lemon juice, lime juice and sour orange juice.

632. Licorice root, unground.

633. Life-boat and life-saving apparatus specially imported by societies incorporated or established to encourage the saving of human life.

634. Lime, citrate of.

635. Lime, chlorate of, or bleaching powder.
636. Lithographic stones, not engraved.
637. Litmus, prepared or not prepared.
638. Loadstones.
639. Madder and munjet, or Indian madder, ground or prepared, and all extracts of.
640. Magnesito, or native mineral carbonate of magnesia.
641. Magnesium.
642. Magnets.
643. Manganese, oxide and ore of.
644. Manna.
645. Manuscripts.
646. Marrow, crude.
647. Marsh-mallows.
648. Medals of gold, silver or copper, such as trophies or prizes.
649. Meerschaum, crude or unmanufactured.
650. Mineral waters, all not artificial.
651. Minerals, crude, or not advanced in value or condition by refining or grinding, or by other process of manufacture, not specially provided for in this act.
652. Models of inventions and of other improvements in the arts, including patterns for machinery, but no article shall be deemed a model or pattern which can be fitted for use otherwise.
653. Moss, sea-weed and vegetable substances, crude or unmanufactured, not otherwise specially provided for in this act.
654. Musk, crude, in natural pods.
655. Myrobolan.
656. Needles, hand-sewing and darning.
657. Newspapers and periodicals; but the term "periodicals" as herein used shall be understood to embrace only unbound or paper-covered publications containing current literature of the day and issued regularly at stated periods, as weekly, monthly or quarterly.
658. Nux vomica.
659. Oakum.
660. Oil cake.
661. Oils: Almond, amber, crude and rectified ambergris, anise or anise-seed, canaline, aspic or spike lavender, bergamot, cajeput, caraway, cassia, cinnamon, Jedrat, chamomile, citronella or lemon grass, civet, fennel, Jasmine or Jasimine, nuglandium, Juniper, lavender, lemon, limes, mace, neroli or orange flower, out oil or oil of nuts, not otherwise specially provided for in this act, orange oil, olive oil for manufacturing or mechanical purposes unfit for eating and not atherwise provided for in this act, ottar of roses, palm and cocoanut, rosemary or anthoss, sesame or sesamum-seed or bean, thyme, origanum red or white, valerian, and also spermaceti, whale and other fish oils of American fisheries, and all other articles the produce of such fisheries.
662. Olives, green or unprepared.
663. Opium, crude or unmanufactured, and not adulterated, containing nine per centum and over of morphia.
664. Orange and lemon peel, not preserved, candied, or otherwise prepared.
665. Orchil, or orchil liquid.
666. Orchids, lily of the valley, azaleas, palms and other plants used for forcing under glass for cut flowers or decorative purposes.
667. Ores, of gold, silver and nickel, and nickel matte: *Provided*, That ores of nickel and nickel matte, containing more than two per centum of copper, shall pay a duty of one-half of one cent per pound on the copper contained therein.
668. Osmium.
669. Palladium.
670. Paper stock, crude, of every description, including all grasses, fibers, rags (other than wool), waste, shavings, clippings, old paper, rope ends, waste

rope, waste bagging, old or refuse gunny bags or gunny cloth, and poplar or other woods, fit only to be converted into paper.

671. Paraffine.

672. Parchment and vellum.

673. Pearl, mother of, not sawed, cut, polished, or otherwise manufactured.

674. Peltries and other usual goods and effects of Indians passing or repassing the boundary line of the United States, under such regulations as the Secretary of the Treasury may prescribe: *Provided*, That this exemption shall not apply to goods in bales or other packages unusual among Indians.

675. Personal and household effects not merchandise of citizens of the United States dying in foreign countries.

676. Pewter and britannia metal, old, and fit only to be remanufactured.

677. Philosophical and scientific apparatus, instruments and preparations; statuary, casts of marble, bronze, alabaster, or plaster of Paris; paintings, drawings, and etchings, specially imported in good faith for the use of any society or institution incorporated or established for religious, philosophical, educational, scientific, or literary purposes, or for encouragement of the fine arts, and not intended for sale.

678. Phosphates, crude or native.

679. Plants, trees, shrubs, roots, seed-cane, and seeds, all of the foregoing imported by the Department of Agriculture or the United States Botanic Garden.

680. Plaster of Paris and sulphate of lime, unground.

681. Platina, in ingots, bars, sheets and wire.

682. Platinum, unmanufactured, and vases, retorts, and other apparatus, vessels, and parts thereof composed of platinum, for chemical uses.

683. Plumbago.

684. Polishing-stones.

685. Potash, crude, carbonate of, or "black salts." Caustic potash, or hydrate of, not including refined in sticks or rolls. Nitrate of potash, or saltpeter, crude. Sulphate of potash, crude or refined. Chlorate of potash. Muriate of potash.

686. Professional books, implements, instruments, and tools of trade, occupation, or employment, in the actual possession at the time of persons arriving in the United States; but this exemption shall not be construed to include machinery or other articles imported for use in any manufacturing establishment, or for any person or persons, or for sale.

687. Pulu.

688. Pumice.

689. Quills, prepared or unprepared, but not made up into complete articles.

690. Quinia, sulphate of, and all alkaloids or salts of cinchona-bark.

691. Rags, not otherwise specially provided for in this act.

692. Regalia and gems, statues, statuary and specimens of sculpture, where specially imported in good faith for the use of any society incorporated or established solely for educational, philosophical, literary, or religious purposes, or for the encouragement of fine arts, or for the use by order of any college, academy, school, seminary of learning, or public library in the United States; but the term "regalia" as herein used shall be held to embrace only such insignia of rank or office or emblems as may be worn upon the person or borne in the hand during public exercises of the society or institution, and shall not include articles of furniture or fixtures or of regular wearing-apparel, nor personal property of individuals.

693. Rennets, raw or prepared.

694. Saffron and safflower, and extract of, and saffron cake.

695. Sago, crude, and sago flour.

696. Salacine.

697. Sauer-kraut.

698. Sausage skins.

699. Seeds, anise, canary, caraway, cardamom, coriander, cotton, cummin, fennel, fenugreek, hemp, hoarhound, mustard, rape, Saint John's bread or bean, sugar-beet, mangel-wurzel, sorghum or sugar-cane for seed, all flower and grass

seeds; bulbs and bulbous roots, not edible; all the foregoing not specially provided for in this act.

700. Selep or saloup.

701. Shells of all kinds, not cut, ground or otherwise manufactured.

702. Shot-gun barrels, forged, rough bored.

703. Shrimps and other shell fish.

704. Silk, raw, or as reeled from the cocoon, but not doubled, twisted or advanced in manufacture in any way.

705. Silk cocoons and silk waste.

706. Silk worms' eggs

707. Skeletons and other preparations of anatomy.

708. Snails.

709. Soda, nitrate of, or cubic nitrate, and chlorate of.

710. Sodium

711. Sparterre, suitable for making or ornamenting hats.

712. Specimens of natural history, botany and mineralogy, when imported for cabinets or as objects of science, and not for sale.

SPICES. **713.** Cassia, cassia vera, and cassia buds unground.

714. Cinnamon, and chips of, unground.

715. Cloves, and clove stems, unground.

716. Ginger-root, unground and not preserved or candied.

715. Mace.

718. Nutmegs.

719. Pepper, black or white, unground.

720. Pimento, unground.

721. Spunk.

722. Spurs and stilts, used in the manufacture of earthen, porcelain and stone ware.

723. Stone and sand, burr stone in blocks, rough or manufactured, and not bound up into mill-stones; cliff-stone, unmanufactured; pumice-stone, rotten stone and sand, crude or manufactured.

724. Storax or styrax.

725. Strontia, oxide of, protoxide of strontian, and strontianite, or minera carbonate of strontia.

726. Sugars, all not above number sixteen Dutch standard in color, all tank bottoms, all sugar drainings and sugar sweepings, sirups of cane juice, melada, concentrated melada, and concrete and concentrated molasses, and molasses.

727. Sulphur, lac or precipitated, and sulphur or brimstone, crude, in bulk, sulphur ore, as pyrites or sulphuret of iron in its natural state, containing in excess of twenty-five per centum of sulphur (except on the copper contained therein), and sulphur not otherwise provided for.

728. Sulphuric acid which, at the temperature of sixty degrees Fahrenheit, does not exceed the specific gravity of one and three hundred and eighty thousandths, for use in manufacturing super-phosphate of lime or artificial manures of any kind, or for any agricultural purposes.

729. Sweepings of silver and gold.

730. Tapioca, cassava or cassady.

731. Tar and pitch of wood, and pitch of coal tar.

732. Tea and tea-plants.

733. Teeth, natural or unmanufactured.

734. Terra alba.

735. Terra japonica.

736. Tin ore, cassiterite or black oxide of tin, and tin in bars, blocks, pigs, or grain or granulated, until July the first, eighteen hundred and ninety-three, and thereafter as otherwise provided for in this act.

737. Tinsel wire, lame or lahn.

738. Tobacco stems.

739. Tonquin, tonqua, or tonka-beans.

740. Tripoli.

741. Turmeric.

742. Turpentine, Venice.
743. Turpentine, spirits of.
744. Turtles.
745. Types, old, and fit only to be remanufactured.
746. Uranium, oxide and salts of.
747. Vaccine virus.
748. Valonia.
749. Verdigris or subacetate of copper.
750. Wafers, unmedicated.
751. Wax, vegetable or mineral.
752. Wearing apparel and other personal effects (not merchandise) of persons arriving in the United States, but this exemption shall not be held to include articles not actually in use and necessary and appropriate for the use of such persons for the purposes of their journey and present comfort and convenience, or which are intended for any other person or persons, or for sale: *Provided, however,* That all such wearing apparel and other personal effects as may have been once imported into the United States and subjected to the payment of duty, and which may have been actually used and taken or exported to foreign countries by the persons returning therewith to the United States, shall, if not advanced in value or improved in condition by any means since their exportation from the United States, be entitled to exemption from duty, upon their identity being established, under such rules and regulations as may be prescribed by the Secretary of the Treasury.
753. Whalebone, unmanufactured.
754. Wood—Logs and round unmanufactured timber not specially enumerated or provided for in this act.
755. Fire wood, handle-bolts, heading-bolts, stave-bolts and shingle-bolts, hop-poles, fence posts, railroad ties, ship timber, and ship planking, not specially provided for in this act.
756. Woods, namely, cedar, lignum-vitæ, lancewood, ebony, box, granadilla, mahogany, rosewood, satinwood, and all forms of cabinet woods, in the log, rough or hewn; bamboo and rattan unmanufactured; briar root or briar wood, and similar wood unmanufactured, or not further manufactured than cut into blocks suitable for articles into which they are intended to be converted; bamboo, reeds and sticks of partridge, hair-wood, pimento, orange, myrtle and other woods not otherwise specially provided for in this act, in the rough, or not further manufactured than cut into lengths suitable for sticks for umbrellas, parasols, sun shades, whips or walking-canes; and India malacca joints, not further manufactured than cut into suitable lengths for the manufactures into which they are intended to be converted.
757. Works of art, the production of American artists residing temporarily abroad, or other works of art, including pictorial paintings on glass, imported expressly for presentation to a national institution, or to any state or municipal corporation, or incorporated religious society, college or other public institution, except stained or painted window-glass or stained or painted glass windows; but such exemption shall be subject to such regulations as the Secretary of the Treasury may prescribe.
758. Works of art, drawings, engravings, photographic pictures, and philosophical and scientific apparatus brought by professional artists, lecturers or scientists arriving from abroad for use by them temporarily for exhibition and in illustration, promotion and encouragement of art, science or industry in the United States, and not for sale, and photographic pictures, paintings and statuary, imported for exhibition by any association established in good faith and duly authorized under the laws of the United States, or of any State, expressly and solely for the promotion and encouragement of science, art, or industry, and not intended for sale, shall be admitted free of duty, under such regulations as the Secretary of the Treasury shall prescribe; but bonds shall be given for the payment to the United States of such duties as may be imposed by law upon any and all of such articles as shall not be exported within six months after such importation: *Provided,* That the Secretary of the Treasury may, in his discretion, ex-

tend such period for a further term of six months in cases where applications therefor shall be made.

759. Works of art, collections in illustration of the progress of the arts, science, or manufactures, photographs, works in terra-cotta, parian pottery or porcelain, and artistic copies of antiquities in metal or other material hereafter imported in good faith for permanent exhibition at a fixed place by any society or institution established for the encouragement of the arts or of science, and all like articles imported in good faith by any society or association for the purpose of erecting a public monument, and not intended for sale, nor for any other purpose than herein expressed; but bonds shall be given under such rules and regulations as the Secretary of the Treasury may prescribe, for the payment of lawful duties which may accrue should any of the articles aforesaid be sold, transferred or used contrary to this provision, and such articles shall be subject, at any time, to examination and inspection by the proper officers of the customs. *Provided*, That the privileges of this and the preceding section shall not be allowed to associations or corporations engaged in or connected with business of a private or commercial character.

760. Yams.

761. Zaffer.

RECIPROCITY.

SEC. 3. That with a view to secure reciprocal trade with countries producing the following articles, and for this purpose, on and after the first day of January, eighteen hundred and ninety-two, whenever, and so often as the President shall be satisfied that the government of any country producing and exporting sugars, molasses, coffee, tea and hides, raw and uncured, or any of such articles, imposes duties or other exactions upon the agricultural or other products of the United States, which in view of the free introduction of such sugar, molasses, coffee, tea and hides into the United States, he may deem to be reciprocally unequal and unreasonable, he shall have the power and it shall be his duty to suspend, by proclamation to that effect, the provisions of this act relating to the free introduction of such sugar, molasses, coffee, tea and hides, the production of such country, for such time as he shall deem just, and in such case and during such suspension duties shall be levied, collected and paid upon sugar, molasses, coffee, tea and hides, the product of or exported from such designated country as follows, namely:

All sugars not above number thirteen Dutch standard in color shall pay duty on their polariscopic tests as follows, namely:

All sugars not above number thirteen Dutch standard in color, all tank bottoms, sirups of cane juice or of beet juice, melada, concentrated melada, concrete and concentrated molasses, testing by the polariscope not above seventy-five degrees, seven-tenths of one cent per pound; and for every additional degree or fraction of a degree shown by the polariscopic test, two hundredths of one cent per pound additional.

All sugars above number thirteen Dutch standard in color shall be classified by the Dutch standard of color, and pay duty as follows, namely: All sugar above number thirteen and not above number sixteen Dutch standard of color, one and three-eighths cents per pound.

All sugars above number sixteen and not above number twenty Dutch standard of color, one and five-eighths cents per pound.

All sugars above number twenty Dutch standard of color, two cents per pound.

Molasses testing above fifty-six degrees, four cents per gallon.

Sugar drainings and sugar sweepings shall be subject to duty either as molasses or sugar, as the case may be, according to polariscopic test.

On coffee, three cents per pound.

On tea, ten cents per pound.

Hides, raw or uncured, whether dry, salted or pickled, Angora goat-skins, raw, without the wool, unmanufactured, asses' skins, raw or unmanufactured, and skins, except sheep-skins with the wool on, and one and one-half cents per pound.

SEC. 4. That there shall be levied, collected, and paid on the importation of all raw or unmanufactured articles, not enumerated or provided for in this act, a duty of ten per centum ad valorem; and on all articles manufactured, in whole or in part, not provided for in this act, a duty of twenty per centum ad valorem.

ASSIMILATION SECTION.

SEC 5. That each and every imported article, not enumerated in this act, which is similar, either in material, quality, texture, or the use to which it may be applied, to any article enumerated in this act as chargeable with duty shall pay the same rate of duty which is levied on the enumerated article which it most resembles in any of the particulars before mentioned; and if any non-enumerated article equally resembles two or more enumerated articles on which different rates of duty are chargeable there shall be levied on such non-enumerated article the same rate of duty as is chargeable on the article which it resembles paying the highest rate of duty; and on articles not enumerated, manufactured of two or more materials, the duty shall be assessed at the highest rate at which the same would be chargeable if composed wholly of the component material thereof of chief value; and the words "component material of chief value," wherever used in this act, shall be held to mean that component material which shall exceed in value any other single component material of the article; and the value of each component material shall be determined by the ascertained value of such material in its condition as found in the article. If two or more rates of duty shall be applicable to any imported article it shall pay a duty at the highest of such rates.

MISCELLANEOUS PROVISIONS.

SEC. 6. That on and after the first day of March, eighteen hundred and ninety-one, all articles of foreign manufacture, such as are usually or ordinarily marked, stamped, branded, or labeled, and all packages containing such or other imported articles, shall, respectively, be plainly marked, stamped, branded, or labeled in legible English words, so as to indicate the country of their origin; and unless so marked, stamped, branded, or labeled, they shall not be admitted to entry.

SEC. 7. That on and after March first, eighteen hundred and ninety-one, no article of imported merchandise which shall copy or simulate the name or trade mark of any domestic manufacture or manufacturer, shall be admitted to entry at any custom house of the United States. And in order to aid the officers of the customs in enforcing prohibition any domestic manufacturer who has adopted trade marks may require his name and residence and a description of his trade marks to be recorded in books which shall be kept for that purpose in the Department of the Treasury, under such regulations as the Secretary of the Treasury shall prescribe, and may furnish to the Department fac similes of such trade marks; and thereupon the Secretary of the Treasury shall cause one or more copies of the same to be transmitted to each collector or other proper officer of the customs.

SEC. 8. That all lumber, timber, hemp, manilla, wire rope, and iron and steel rods, bars, spikes, nails, plates, tees, angles, beams and bolts, and copper and composition metals which may be necessary for the construction and equipment of vessels built in the United States for foreign account and ownership or for the

purpose of being employed in the foreign trade, including the trade between the Atlantic and Pacific ports of the United States, after the passage of this act, may be imported in bond, under such regulations as the Secretary of the Treasury may prescribe; and upon proof that such materials have been used for such purpose no duties shall be paid thereon. But vessels receiving the benefit of this section shall not be allowed to engage in the coastwise trade of the United States more than two months in any one year, except upon the payment to the United States of the duties on which a rebate is herein allowed: *Provided*, That vessels built in the United States for foreign account and ownership shall not be allowed to engage in the coastwise trade of the United States.

SEC. 9. That all articles of foreign production needed for the repair of the American vessels engaged in foreign trade, including the trade between the Atlantic and Pacific ports of the United States, may be withdrawn from bonded warehouses free of duty, under such regulations as the Secretary of the Treasury may prescribe.

SEC. 10. That all medicines, preparations, compositions, perfumery, cosmetics, cordials and other liquors manufactured wholly or in part of domestic spirits, intended for exportation, as provided by law, in order to be manufactured and sold or removed, without being charged with duty and without having a stamp affixed thereto, shall, under such regulations as the Secretary of the Treasury may prescribe, be made and manufactured in warehouses similarly constructed to those known and designated in Treasury regulations as bonded-warehouses, class two: *Provided*, That such manufacturer shall first give satisfactory bonds to the collector of internal revenue for the faithful observance of all the provisions of law and the regulations aforesaid, in amount not less than half of that required by the regulations of the Secretary of the Treasury from persons allowed bonded-warehouses. Such goods, when manufactured in such warehouses, may be removed for exportation under the direction of the proper officer having charge thereof, who shall be designated by the Secretary of the Treasury, without being charged with duty, and without having a stamp affixed thereto. Any manufacturer of the articles aforesaid, or any of them, having such bonded warehouse as aforesaid, shall be at liberty, under such regulations as the Secretary of the Treasury may prescribe, to convey therein any materials to be used in such manufacture which are allowed by the provisions of law to be exported free from tax or duty, as well as the necessary materials, implements, packages, vessels, brands and labels for the preparation, putting up and export of said manufactured articles; and every article so used shall be exempt from the payment of stamp and excise duty by such manufacturer. Articles and materials so to be used may be transferred from any bonded warehouse in which the same may be, under such regulations as the Secretary of the Treasury may prescribe, into any bonded warehouse in which such manufacture may be conducted, and may be used in such manufacture, and when so used shall be exempt from stamp and excise duty; and the receipt of the officer in charge as aforesaid shall be received as a voucher for the manufacture of such articles. Any materials imported into the United States may, under such rules as the Secretary of the Treasury may prescribe, and under the direction of the proper officer, be removed in original packages from on ship-board, or from the bonded warehouse in which the same may be, into the bonded warehouse in which such manufacture may be carried on, for the purpose of being used in such manufacture, without payment of duties thereon, and may be used in such manufacture. No article so removed, nor any article manufactured in said bonded warehouse, shall be taken therefrom except for exportation, under the direction of the proper officer having charge thereof as aforesaid, whose certificate, describing the articles by their mark or otherwise, the quantity, the date of importation and name of vessel, with such additional particulars as may from time to time be required, shall be received by the collector of customs in cancellation of the bond or return of the amount of foreign import duties. All labor performed and services rendered under these regulations shall be under the supervision of an officer of the customs, and at the expense of the manufacturer.

SEC. 11. All persons are prohibited from importing into the United States from any

foreign country any obscene book, pamphlet, writing paper, advertisement, circular, print, picture, drawing or other representation, figure or image on or of paper or other material, or any cast, instrument or other article of an immoral nature, or any drug or medicine, or any article whatever, for the prevention of conception, or for causing unlawful abortion. No such articles, whether imported separately or contained in packages with other goods entitled to entry, shall be admitted to entry, and all such articles shall be proceeded against, seized and forfeited by due course of law. All such prohibited articles and the package in which they are contained in the course of importation shall be detained by the officer of customs, and proceedings taken against the same as prescribed in the following section, unless it appears to the satisfaction of the collector of customs that the obscene articles contained in the package were inclosed therein without the knowledge or consent of the importer, owner, agent or consignee: *Provided*, That the drugs hereinbefore mentioned, when imported in bulk and not put up for any of the purposes hereinbefore specified, are excepted from the operation of this section.

SEC. 12. That whoever, being an officer, agent or employe of the Government of the United States, shall knowingly aid or abet any person engaged in any violation of any of the provisions of law prohibiting importing, advertising, dealing in, exhibiting or sending or receiving by mail obscene or indecent publications or representations, or means for preventing conception or procuring abortion, or other articles of indecent or immoral use or tendency, shall be deemed guilty of a misdemeanor, and shall for every offense be punishable by a fine of not more than five thousand dollars, or by imprisonment at hard labor for not more than ten years, or both.

SEC. 13. That any judge of any district or circuit court of the United States, within the proper district, before whom complainant in writing of any violation of the two preceding sections is made, to the satisfaction of such judge, and founded on knowledge or belief, and if upon belief, setting forth the grounds of such belief, and supported by oath or affirmation of the complainant, may issue, conformably to the Constitution, a warrant directed to the marshal or any deputy marshal, in the proper district, directing him to search for, seize and take possession of any such article or thing mentioned in the two preceding sections, and to make due and immediate return thereof to the end that the same may be condemned and destroyed by proceedings which shall be conducted in the same manner as other proceedings in the case of municipal seizure, and with the same right of appeal or writ of error.

SEC. 14. That machinery for repair may be imported into the United States without payment of duty, under bond, to be given in double the appraised value thereof, to be withdrawn and exported after said machinery shall have been repaired; and the Secretary of the Treasury is authorized and directed to prescribe such rules and regulations as may be necessary to protect the revenue against fraud, and secure the identity and character of all such importations when again withdrawn and exported, restricting and limiting the export and withdrawal to the same port of entry where imported, and also limiting all bonds to a period of time of not more than six months from the date of the importation.

SEC. 15. That the produce of the forests of the State of Maine upon the Saint John river and its tributaries, owned by American citizens, and sawed or hewed in the Provence of New Brunswick by American citizens, the same being unmanufactured in whole or in part, which is now admitted into the ports of the United States free of duty, shall continue to be so admitted under such regulations as the Secretary of the Treasury shall, from time to time, prescribe.

SEC. 16. That the produce of the forests of the State of Maine upon the Saint Croix river and its tributaries, owned by American citizens, and sawed in the Province of New Brunswick by American citizens, the same being unmanufactured in whole or in part, shall be admitted into the ports of the United States free of duty, under such regulations as the Secretary of the Treasury shall, from time to time, prescribe.

SEC. 17. That a discriminating duty of ten per centum ad valorem, in addition to the duties imposed by law, shall be levied, collected and paid on all goods,

wares or merchandise which shall be imported in vessels not of the United States; but this discriminating duty shall not apply to goods, wares and merchandise which shall be imported in vessels not of the United States, entitled, by treaty or any act of Congress, to be entered into the ports of the United States on payment of the same duties as shall then be paid on goods, wares and merchandise imported in vessels of the United States.

SEC. 18. That no goods, wares or merchandise, unless in cases provided for by treaty, shall be imported into the United States from any foreign part or place, except in vessels of the United States, or in such foreign vessels as truly and wholly belong to the citizens and subjects of that country of which the goods are the growth, production or manufacture, or from which such goods, wares or merchandise can only be, or most usually are, first shipped for transportation. All goods, wares or merchandise imported contrary to this section, and the vessel wherein the same shall be imported, together with her cargo, tackle, apparel and furniture, shall be forfeited to the United States; and such goods, wares or merchandise, ship or vessel and cargo, shall be liable to be seized, prosecuted and condemned in like manner and under the same regulations, restrictions and provisions as have been heretofore established for the recovery, collection, distribution and remission of forfeitures to the United States by the several revenue laws.

SEC. 19. That the preceding section shall not apply to vessels or goods, wares or merchandise imported in vessels of a foreign nation which does not maintain a similar regulation against vessels of the United States.

SEC. 20. That the importation of neat cattle and the hide of neat cattle from any foreign country into the United States is prohibited: *Provided*, That the operation of this section shall be suspended as to any foreign country or countries, or any parts of such country or countries, whenever the Secretary of the Treasury shall officially determine, and give public notice thereof that such importation will not tend to the introduction or spread of contagious or infectious diseases among the cattle of the United States; and the Secretary of the Treasury is hereby authorized and empowered, and it shall be his duty, to make all necessary orders and regulations to carry this section into effect, or to suspend the same as therein provided, and to send copies thereof to the proper officers in the United States, and to such officers or agents of the United States in foreign countries as he shall judge necessary.

SEC. 21. That any person convicted of a willful violation of any of the provisions of the preceding section shall be fined not exceeding five hundred dollars, or imprisoned not exceeding one year, or both, in the discretion of the court.

SEC. 22. That upon the reimportation of articles once exported of the growth, product, or manufacture of the United States, upon which no internal tax has been assessed or paid, or upon which such tax has been paid and refunded by allowance or drawback, there shall be levied, collected and paid a duty equal to the tax imposed by the internal revenue laws upon such articles, except articles manufactured in bonded-warehouses and exported pursuant to law, which shall be subject to the same rate of duty as if originally exported.

SEC. 23. That whenever any vessel laden with merchandise in whole or in part subject to duty has been sunk in any river, harbor, bay, or waters, subject to the jurisdiction of the United States, and within its limits, for the period of two years, and is abandoned by the owner thereof, any person who may raise such vessel shall be permitted to bring any merchandise recovered therefrom into the port nearest to the place where such vessel was so raised, free from the payment of any duty thereupon, and without being obliged to enter the same at the custom-house; but under such regulations as the Secretary of the Treasury may prescribe.

SEC. 24. That the works of manufacturers engaged in smelting or refining metals in the United States may be designated as bonded-warehouses under such regulations as the Secretary of the Treasury may prescribe: *Provided*, That such manufacturers shall first give satisfactory bonds to the Secretary of the Treasury. Metals in any crude form requiring smelting or refining to make them readily available in the arts, imported into the United States to be smelted or refined and intended to be exported in a refined but unmanufactured state, shall,

under such rules as the Secretary of the Treasury may prescribe and under the direction of the proper officers, be removed in original packages or in bulk from the vessel or other vehicle on which it has been imported, or from the bonded-warehouse in which the same may be into the bonded-warehouse in which such smelting and refining may be carried on, for the purpose of being smelted and refined without payment of duties thereon, and may there be smelted and refined, together with other metals of home or foreign production: *Provided*, That each day a quantity of refined metal, equal to the amount of imported metal refined that day shall be set aside, and such metal so set aside shall not be taken from said works except for importation, under the direction of the proper officer having charge thereof as aforesaid, whose certificate, describing the articles by their marks or otherwise, the quantity, the date of importation, and the name of vessel or other vehicle by which it was imported, with such additional particulars as may from time to time be required, shall be received by the collector of customs as sufficient evidence of the exportation of the metal, or it may be removed, under such regulations as the Secretary of the Treasury may prescribe, to any other bonded-warehouse, or upon entry for, and payment of duties, for domestic consumption. All labor performed and services rendered under these regulations shall be under the supervision of an officer of the customs, to be appointed by the Secretary of the Treasury, and at the expense of the manufacturer.

SEC. 25. That where imported materials on which duties have been paid are used in the manufacture of articles manufactured or produced in the United States, there shall be allowed on the exportation of such articles a drawback equal in amount to the duties paid on the materials used, less one per centum of such duties: *Provided*, That when the articles exported are made in part from domestic materials, the imported materials, or the parts of the articles made from such materials shall so appear in the completed articles that the quantity or measure thereof may be ascertained: *And provided further*, That the drawback on any article allowed under existiug law shall be continued at the rate herein provided. That the imported materials used in the manufacture or production of articles entitled to a drawback of customs duties when exported shall in all cases where drawback duties paid on such materials is claimed, be identified, the quantity of such materials used and the amount of duties paid thereon shall be ascertained, the facts of the manufacture or production of such articles in the United States and their exportation therefrom shall be determined, and the drawback due thereon shall be paid to the manufacturer, producer, or exporter, to the agent of either or to the person to whom such manufacturer, producer, exporter or agent shall in writing order such drawback paid, under such regulations as the Secretary of the Treasury shall prescribe.

THE TARIFF—ALPHABETICAL INDEX.

The numbers refer to paragraphs in preceding pages.

ABSINTHE 332. Acids, acetic 1; boracic 2; chromic 3; citric 4; chemical n. o. p. 473; for manufacturing purposes 473; medicinal n. o. p. 473; pyroligneous 1; tartaric 7; tannin 6; sulphuric 5, 728. Acetic acid 1. Acetate of lead, white 62; brown 62. Acorns 475. Acorns, prepared 321. Aconite 474. Adhesive felt 569. Agate buttons 429; unmanufactured 476. Agricultural seeds 286. Alabaster 459. Alabaster casts 677. Albata 188. Albumen 477. Albumenized paper 419. Albums, photograph 420; autograph 420; scrap 420. Alcohol, amylic 42; compounds 8, 331; perfumery 8; preparations 331. Ale 337. Ale, ginger 340. Alizarine 478; assistant 36; all other 36. Alkalies 76. Alkaloids 76. Alkaline silicate 84. Almond, oils 661. Alloys 146. Almonds 306. Alpaca, advanced 390; hair, how divided 375. Alumina 9. Alum 9. Aluminium 186. Aluminum, alloys 186. Aluminum, leaf 190. Alum cake 9. Alum patent 9. Alumina, sulphate of 9. Alum in crystals 9. Aluminous cake 9. Alum, ground 9. Amber, unmanufactured 479. Amber oils 661. Ambergris 480. American artist

productions n. o. p. 757. Ammonia, sulphate of 10. Ammonia, carbonate of 10. Ammonia, muriate of 10. Amylic, alcohol 42. Anchovies 291. Anchors 153. Anchors, steel 153. Andirons 161. Angora goat skins 605. Angles 137. Animals 251, 482, 483. Animal, carbon 511; hair 604; skins 605; hair, how divided 375. Aniline, arseniate of 490; salts 481; oil 661. Anise seed 699. Anise seed oil 661. Annatto 484. Antiquities 524. Anthoss oil 661. Antimony 187; ore 485. Anvils, iron 155; steel 155. Apatite 486. Apples 297, 298; dried 298; desiccated 298; evaporated 298; prepared 298. Appropriation for sugar bounty 231. Aqueous extract of opium 47. Argal 487. Argentine 188. Aromatic seeds 560. Arrack 332. Arrow root 488. Arsenic 489. Arseniate of aniline 490. Art squares 408. Artificial feathers 443. Articles, tin coated 143; of domestic manufacture 493. Artificial sulphate of barytes 51. Artists' water color paints 61 Art educational stops 491; works of 757, 758, 759. Asbestos 459, 494. Asafetida 497. Ashes 495. Asphaltum 496. Aspic oil 661. Aubusson carpets 399. Australia wool 376. Autograph albums 420. Axles 154, bars 154; flanks 154; forgings 154. Axminster carpets 399. Azaleas 666.

BACON 310. Bagatelle balls 435. Bagging, flax 366; hemp 366; jute 366; jute butts 366. Bags of burlaps 365. Balls, pool 435; bagatelle 435; billiard 435. Balm of Gilead 498. Balsams 560. Bamboo 756. Band iron 140, 151; steel 140; iron or steel 143. Barks 499, 560; extracts of 26. Bark, cinchona, salts of 690; cork 434. Barley 252; hulled 254; patent 254; pearled 254; malt 253. Bars 140; beveled 146; iron 135, 136, 152; tapered 146; tin 209; rolled iron 136 Barrels 228. Barrel hoops, iron 140; hoops steel 140. Barrel buttons 398. Baryta 500; sulphate of 49. Barytes 49; artificial, sulphate of 51; earth, manufactured 49; earth, unmanufactured 49. Basswood, sawed boards, planks and deals 218; lumber 218. Bauxite or beauxite 501. Bay rum 334. Bay water 334. Beads, glass 445. Beams, deck 137. Beams of iron 137. Beans 270, 560; bulb 137; castor 284; ground 308; prepared or preserved 271 Bed sides 408. Beer 337; coloring 22; ginger 340. Beet root ashes 495. Beef 311. Beeswax 502. Bells 503; Beltings 398, 412. Belt pins 206 Bend or belting leather 455 Bergamot oil 661. Berlin blue 50; carpets 399; rugs 399. Berries 560. Beveled bars 146. Bicarbonate of soda 30. Bichromate of soda 82; of potash 69. Billets 146; iron 136. Billiard balls 435. Binding twine 362. Birds 505; dressed 443; finished 443. stuffed 504. Bismuth 506. Bisque 100; toys 436. Bindings 398, 412. Bitumen 496. Bituminous coal 432. Bitters 332. Blacking 11. Blacksmiths' hammers 156. Black, bone 52. Bladders 459, 507. Blank books 423. Blanks, die 146. Blankets 393. Blanc, fixe 51. Bleaching powder 635. Blocks, all 223 die 146. Block tin 209. Blocks or pigs, zinc 212. Blood dried 508. Blooms 146. iron 130. Blues 50; Berlin 50; Chinese 50; Prussian 50. Blue, ultramarine 55. Blues, all others 50. Blue vitriol 12. Boards, sawed 218. Boards, sawed, of box 220; cedar 220; ebony 220; granadilla 220; lancewood 220; lignumvitæ 220; mahogany 220; rosewood 220; satin wood 220; cabinet wood 220. Board measure, how estimated 218; shoe buttons 431. Bockings 406. Bodkins 178. Boiler iron 138; steel 138; tubes 157. Bolting cloths for milling purposes 510 Bologna sausage 509. Bolts 158. Bolt blanks 158. Bond for sugar bounty 233. Bone 460; ash 511; black 52; buttons 430. Bones, calcined 511. Bone char 13; Bones, crude 511. Bone dice 435; dust 511. Bones, steamed 511. Bonnet pins 206 Books 423, 512, 513, 515, 516; and music in raised print 513; and pamphlets printed in English, exclusive 513. Bookbinders' calfskins 456; goat skins 456. kangaroo skins 456; sheep skins 456. Boots, leather 456; lacings, cotton 354. Boracic acid 2. Bort 557. Borax, crude 14; refined 14. Borate of lime 14; of soda 14. Botany specimens 712. Bottles 340, 341, 103, 104, 207. Bottle glassware 103. Bottoms, copper 195. Bounties, how paid 235; penalties 236. Bounties on sugar 231; who not entitled to 234. Boxwood 756. Box, sawed boards 220; sawed planks 220; sawed deals 220; sawed, all forms 220. Box or ship's chronometers 210. Braces, cotton 354. Braces 398, 412. Brads 177. Braids 398, 412, 518; cotton 354. Briar root 756. Briarwood 756. Brandy 329, 330, 333. Bread knives 167. Breccia in blocks or slabs 520. Brandy coloring 22. Brass 189; bars 189; clippings 189; old 189; pigs 189. Braziers' copper 195. Brazil paste 517; nuts 583. Brazilian pebble 519. Brick 94. Brimstone 727. British

gum 324. Bristles 426. Britannia metal 676. Brown grease 316. Broken rice 261. Bromine 521. Broom corn 272. Brooms 427. Bronze casts 677; powder 190. Brussels carpets 401. Brushes 427. Buckwheat 255. Buds 560. Buenos Ayres wool 376. Building forms 137; stone 127, 128. Bulbs 560 Bulb beans 137. Bullion 522. Bullions 196. Burgundy pitch 523. Burlap bags 365. Burlaps, of flax 364; of hemp, 364; of jute 364. Burnt starch 324; chicory root 317. Burr stone 126, 723. Butchers' knives 167. Beets 233, 234. Butter 266; cocoa 320. Butterine, cocoa 320. Butter knives 167; substitutes 266. Buttons, agate 429; bone 430; forms 428; silk 398, 412; for tassels or ornaments 398; horn 430; ivory 430; pearl 429; shell 429; vegetable ivory 430.

CABBAGES 273. Cabinetwoods 756; sawed boards 220; sawed planks 220; sawed deals 220; sawed, all forms 220. Cabinet furniture 230. Cables 362. Cables, hemp 362; tarred 362. Cadmium 525. Cajeput oil 661. Cake-alum 9. Calamine 526. Calcined, Plaster of Paris 97; magnesia 34. Calfskins, bookbinders' 456; japanned 456; tanned 456. Camels' hair, advanced 390; how divided 375; third-class, duty on 385, 386; Russian 378. Cameos 452; in frames 452. Camphor, crude 527. Camphor, refined 15. Canada wool 376; long wools 377. Canary seed 699. Cans, or packages of tin 296; or packages of other metal 296. Caraway oil 661; seed 699. Carboys 103. Carbon, animal 511. Carbonate of ammonia 10; of potash 685; of strontia 725; of magnesia 34. Cardboards 420. Card-clothing 159. Cards, playing 424. Cardamom seed 699. Carmined indigo 29. Carpeting 399. Carpets, portions of, n. o. p. 408; woven, whole 399; tapestry Brussels 403; treble ingrain 404; three-ply 404; two-ply 405; tapestry velvet 402. Wilton 400; wool, Dutch 405; Aubusson 399; Axminster 399; Berlin 399; Brussels 401; chenille 399; moquette 399; Saxony 400; Tournay 400; velvet 402; all like Saxony, Wilton and Tournay velvet 400; all like Brussels 401; all like velvet and tapestry velvet 402; all like tapestry Brussels 403; of wool, flax or cotton, n. o. p. 407; hemp 363. Carpetings, hemp 363. Carpets, jute 363. Carpetings, jute 363. Car-truck channels 137. Carving knives 167. Cape of Good Hope wools 376. Cases, watch 211. Casks 228. Castor beans 284; seeds 284; oil 37; or castereum 528. Cassava 730. Cassady 730. Cassia oil 661. Cassiterite 209, 736. Cassia 713; vera 713; buds 713. Castings, iron 161. Cast-iron vessels 161; hollow ware 163; iron pipe 160. Castings, malleable iron 162. Cast, scrap iron 134. Catgut 459, 529. Cattle 248. Caustic, soda 81; potash 70, 685. Cayenne pepper 326. Cedar 219, 756. Cedar, sawed boards 220; sawed planks 220; sawed deals 220; sawed, all forms 220. Cedrat oil 661. Cement 95. Cement copper 193; hydraulic 95; Portland 95; Roman 95. Cerium 530. Chairs 164. Chair, Venetian carpets 404; carne 229; reeds 228. Chalk, French 16; precipitated 16; prepared 16; preparations 16; red 16; unmanufactured 531. Chamois skin 456. Chamomile oil 661. Champagne 335; Channels 137; car truck 137. Charcoal 532. Charms 100. Charts 423, 512, 514, 515. Chemical compounds 76; glassware 107; salts 76. Chenille carpets 399; curtains 351. Cheese 267. Cherry juice 339. Cheroots 246. Chess-balls 435. Chessmen 435. Chewing tobacco pouches 468. Chicory root 317, 553; burnt 317; granulated 317; ground 317; roasted 317. Children's dress goods 394, 395; hats 451; kid gloves 458; lamb gloves 458; leather gloves 458; schmaschen gloves 458; suede gloves 458. Chinese blue 50. China 98, 100. Chinese matting 575. China toys 436. Chip, manufactures of 460. Chlorate of potash 685; of soda 709; of lime 635. Chloroform 17. Chocolate 318; confectionery 238, 239. Chronometers 210. Chromic acid 3; ore 132. Chromate of iron 132; of soda 82; of potash 69. Chrome green 53; yellow 53. Cider 274. Cigars 246. Cigar wrappers 242. Cigarettes 246. Cigarette books 468; book-covers 468; paper 468. Cinnamon 714; oil 661. Cinchona bark 499. Citric acid 4. Citronnella oil 661. Citrate of lime 634. Civet 534; oil 661. Clapboards, spruce and pine 221, 222. Class one, wools 376; wools 377; wools 378. Clay 98, 535; pipes 468. Cliff stone 723. Cloaks 397. Cloaking, cotton 349. Cloths, iron 148; Italian 394, 395. Clothing, ready made 396. Cloths, steel 148; woolen or worsted 392. Cloth, waterproof 369. Cloves 715. Coat linings 394, 395. Coal 536; bituminous 432. Coals, culm 432. Coal, shale 432; slack 432; stores of American vessels 537; tar 538, 731; tar colors 18; tar dyes 18; tar preparations 19. Cobalt 539; oxide

of 20. Coccullus Indicus 540. Cochineal 541. Cocoa 310. Cocoa 542; butter 320; butterine 320; fiber 542; leaves 542; manufactured 319. Cocoanuts 582. Cocoanut oil 661. Cocoa, prepared 319; shells 542. Cod liver oil 38. Coffee 543. Coffee, substitute 321. Cogged ingots 146. Coins 544. Coir 545; yarn 545. Coke 433. Collodion 21; articles of 21; finished 21; in sheets 21; rolled 21. Cologne water 8. Colors, chromium 53. Colors, coal tar 18; containing quicksilver 57. Coloring for beer 22; for brandy 22; for liquors 22; for wine 22. Colored glass 103. Combing wools, down 377; English blood 377; long 377; other 377. Commissioner of Internal Revenue 231. Common brown earthenware 99; or black sheet iron or sheet steel 142; stoneware 99. Compounds, alcoholic 331; of pyroxyline 21. Common or black taggers, iron or steel 142. Confectionery 238–239. Comfits 303. Connecting rods 146. Copper 546; braziers' 195; bottoms 195; cement 193; clippings 192; old 192; ore 191; copper pipes 195; regulus of 193; rods 195 sheets 195; sulphate of 12. Copperas of iron 23. Copying paper 419; books 419. Coral 452, 459, 547. Cordage 362. Cordage, hemp 362; tarred 362. Cordials 332. Cordial, ginger 336. Cords 398; and tassels 398, 412; cotton 354. Corduroys, cotton 350. Cordova wool 378. Coriander seed 699. Cork bark 434, 548; carpets 369; manufactured 438; wood 548. Corset lacings, cotton 354; wire 148. Cosmetics 77. Corn 256; meal 257. Corrugated iron 142. Corticene 369. Cotton and rubber 349; and silk 348; boot lacings 354; braces 354; braids 354; cloth 344, 345, 346, 347, 348; clothing 349; carpet n. o. p. 407; chenille 351; collars 372; cords 354; corduroys 350; corset lacings 354; cuffs 372; damask 355; drawers 352, 353; galoons 354; gimps 354; goring 354; handkerchiefs 359; hose 352, 353; manufactures 355; neckwear 349; pile fabrics 350; plushes 350; seed 699; seed oil 39; shirts, 352, 353; shoe lacings 354; stockings 352, 353; suspenders 354; table covers 351; thread 342; velvets 350; velveteens 350; warps 342; warp yarn 342; wearing apparel 349; webbing 354; yarn 342. Cotswold wool 377. Covers 408. Curtains, chenille 351. Cut glassware 105. Crank shafts 146. Crayons 61. Cream of tartar 90; nuts 584. Crimped iron 142. Crinoline cloth 448; wire 148. Crochet needles 178. Crockery ware 100. Croton oil 40. Crowbars 156. Crucibles 99. Crude borax 14; glycerine 28. Cryolite 550. Crystals, lees 91. Cudbear 551. Culm coal 432. Cummin seed 699. Curled hair 450. Curling stones 552; stone handle 552. Currants 578. Curry 553; powder 553. Cutch 554. Cuttlefish bone 555. Cutlery 165. Cut tacks 177. Cyanite 625.

DAMASK, cotton 355. Dandelion root, prepared 321; roots 556. Darning needles 659. Dates 579. Deals 218. Decoctions, dye woods 26; logwood 26. Deck beans 137. Degras 316. Demijohns 103. Dentifrices 77. Dextrine 324. Diamond dust 557. Diamonds 452, 557; engravers' 557; glaziers' 557. Distilled oils 76. Dice, bone 435; ivory 435. Die-blanks 146; blocks 146. Distilled spirits 329, 330, 333. Divi-divi 558. Dolls 436. Doll-heads 436 Dolmans 397. Donskoi wool 378. Downs 443; clothing wools 376; combing wools 377; quilts 443. Dragon's blood 559. Draughts 435. Drawback 143; tin 328. Drawers, cotton 352, 353. Drawings 758, 677. Drawing paper 422. Dressed birds 443. Dress goods 394, 395. Dressed poultry 315. Dress trimmings 398 Dressed upper leather 456. Dried apples 298; fibers 560; fish 293; insects 24, 560; peas 281. Dross, burnt pyrites 133; lead 199. Drugs 24, 560; balsams 24; barks 24; beans 24; berries 24; buds 24; bulbs 24; bulbous roots 24; dried fibers 24; fruits 24; flowers 24; gums 24; grains 24; gum resins 24; nut galls 24. Druggets 406. Dusters, feather 427. Dutch metal 189. Dry sand 146. Dyes, coal tar 18. Dye woods 560.

EARTHS 98. Earthenware 100; common brown 99; toys 436. Ebony 756; sawed boards 220; sawed planks 220; sawed deals 220; sawed, all forms 220. Edgings 373. Effects, household 675; personal 675, 752. Eggs 275, 561; yolk of 276. Electrotype plates 180. Embroideries 373, 398, 413. Embroidered gloves 458, handkerchiefs 373. Emery grains 437; ground 437; manufactured 437, ore 562; pulverized 437; refined 437. Engravings 423, 512, 513, 758. Enamel, fusible 122. Enameled iron 171; leather 456. Engraved steel plates 180. Envelopes, paper, 421. Epsom salts 34. Erasers 165. Ergot 563. Essences, fruit 25. Es-

sential oils 76. Etchings 423, 512, 514, 677. Ethers 25; fruit 25; sulphuric 25. Extract of bark 26. Extracts, hemlock bark 26; indigo 29; licorice 33; logwood 26; malt 338; meat 313; meat, fluid 313; sumac 26; saffron 694. Expressed oils 76. Explosive substances 440. Eyeglasses 119. Eyeglass frames 119: lenses 121.

FANS 564. Fancy soaps 79. Farina 565. Fashion plates 566. Feathers 443, 567; artificial 443; ornamental 443. Feather dusters 427. Feldspar 568. Felts 396. Felt carpeting 406. Fence posts 755. Fence wire rods 147. Fennel oil 661; seed 699. Fenugreek seed 699. Felt 569. Ferro-manganese 134. Ferro-silicon 134. Fibers 670. Fiber, tampico 592. Fibrin 570. Figs 300. Fire arms 166; brick 93; boards, paper for 422; wood 755. Filberts 307. Files 168. File blanks 168. Filtering paper 419. First-class hair, duty on 384; wool, duty on 384; wools, how dutiable 381. Fish 571, 572; fresh 293; frozen 293; dried 293; packed in ice 293; smoked 293; pickled 292, 293; prepared 293; salted 293; in cans 295; in packages 295; shell 703; plates 181; oil 46, 661; skins 573; glue 27. Fire crackers 438. Finished birds 443. Flannels for underwear 393. Flasks 207 Flax 357; bagging 366; burlaps 364; carpet, n. o. p. 407; dressed line 358; gill netting 367; linen hydraulic hose 368; manufactures of 371; nets 367; seed 285; seed oil 41; seines 367; straw 356; thread 370; webs 367; yarns 370. Flint 574; hones 574; glass bottles 183. Floats 168. Flocks and mungo 389. Floor matting 575. Floss 410. Flour, sago 695. Flowers 443, 516. Flower seed 699. Flowers of sulphur 88. Foreign country, duty on pine logs, etc. 218. Forgings 153; axle 154; iron 139; steel 139. Forged iron and steel combined 139. Forks, table 167. Fossils 576. Freestone 127, 128. French chalk 16. Fresh fish 293; herrings 294. Friction or lucifer matches 441. Fringes 398, 412. Frostings 61. Frozen fish 293. Fruits 297, 560, 580. Fruit essences 25; ethers 25; knives 167; oils 25; preserved 303, 304; plants 577. Fulminates 439. Fulminating powders 439. Furs 444, 587. Furniture of wood 230. Felt hat bodies 451. Fur manufactures 461; skins 588. Fusel oil 42.

GALLOONS 398, 412; cotton 354. Gambier 589. Garments, outside 397. Garden seeds 286. Gas retorts 102. Gelatine 27. German silver 188. Gill netting 367. Gimps 398; cotton 354. Ginger ale 340; beer 340; cordial 336; root 716. Girders 137. Glanced sheet iron 144; sheet steel 144. Glass, beads 445; beveled 118; bottles 111; broken 590; cast polished plate 115; chimney 108; colored 103; crown 112, 113; cylinder 112, 113; disks 591; embossed 118; enameled 118; engraved 118; etched 118; fluted 114; frosted 118; green 108; ground 118; heavy blown 109; lenses 122; manufactures 108; obscured 118; ornamented 118; rolled 114; rough plate 114; sanded 118; silvered 116; stained 118; thin blown 108; unpolished 112; vials 103; window 112; windows 122. Glassware, opal 110; decorated 106; chemical 107; cut 165; colored 106; engraved 106; gilded 106; printed 106; silvered 106; stained 106. Glazed iron 171. Glaziers' lead 201. Gloves 458; children's kid 458; children's lamb 458; men's leather 458, children's schmaschen 458; children's suede 458; ladies' kid 458; ladies' lamb 458; ladies' suede 458; leather 458; children's leather 450; ladies' schmaschen 458; kid 458; lined 458. Glue 27. Glucose 240. Glue stock 606. Glycerine, crude 28; refined 28. Goat hair, advanced 390; how divided 375; skins, bookbinders' 456. Gold bullion 522. Goldbeaters' molds 598; skins 598. Gold leaf 198; ore 667; pens 205; sweepings 729; thread 196. Gorings 398, 412. Goring cotton 354. Granadilla 756; sawed boards 220; sawed planks 220; sawed deals 220; sawed all forms 220. Grains 560. Granite 127, 128; Granulated chicory root 317. Grapes 299. Grape sugar 240. Grasses 670. Grass, manufactures of 460; seed 699. Grease 599; brown 316; wool 316. Great Britain wool 376. Green peas 281; glass 103. Grindstones 129. Ground chicory root 317; emery 437; mustard 325; spices 326. Gypsum 97. Guano 600. Gums 560. Gum, British 324; rosin 560; substitute 324. Guns 170. Gun barrel molds 146; blocks 223. Gunny bags 601, 670; cloths 601, 671. Gunpowder 440. Guts 602. Gutta percha 603; manufactures 461. Gun wads 446.

HAIR 604; of the alpaca 377; camel 377; goat 377; other like animals 377. Hair-cloth, crinoline cloth 448; hair seating 449. Hair, curled 450; human 447; pencils and quills 427; pins 206; seating 449; wood 756. Hams 310.

Hammers, blacksmiths' 156. Hammered iron 135. Hammer molds 146. Handkerchiefs 413; cotton 349; embroidered 373; hem-stitched 373. Handle bolts 755. Hangings, paper 422. Hand mirrors 122. Hassocks 408. Hats 393; children's 451; men's 451; women's 451. Hat-pins 206; wire 148. Hatters' plush 469; irons 161. Hay 277. Heading blocks, 223; bolts 755. Head nets 398. Hemlock bark, extracts of 26; sawed boards, planks and deals 218; lumber 218. Hemp 360; bagging 366; burlaps 364; cable 362; carpets 363; carpetings 363; cordage 362; linen hydraulic hose 368; manufactures of 371; yarns 370. Hempseed oil 43. Herbs 24, 560. Herrings, fresh 294; pickeled or salted 294; oil 46. Hewn timber 216. Hides 605. Hide cuttings 606; rope 607. Hinges 158. Hinge blanks 158. Hoarhound seed 699. Hob nails 174. Hogs 249. Hollow-ware 163. Honey 278. Hoofs 609. Hoop iron 140, 151; or steel 143; flared, splayed or punched 140; steel, flared, splayed or punched 140; steel 140. Hops 279. Hop poles 775; roots 610. Horns 611. Horn buttons 430. Horses 247. Horse hair 604. Horn, manufactures of 460. Horse shoes 177; nails 194. Hose, cotton 352, 353. Hones 608. House furniture 230. Household effects 675; Hubs 223. Hulled barley 254. Human hair 447; manufactures 461. Hydraulic cement 95. Hydrate of potash 70, 685; soda 81. Hydriodate 71; iodate of 71; iodide of 71.

ICE 612. Imitation mineral waters 341. Improved wools 380. India rubber 613; manufactures 460, 461. Indigo 29, 614; carmined 29; extracts of 29; pastes of 29. Ingots, cogged 146; steel 146. Ingrain carpets 404, 405. Ink 30; powders 30. Insertings 373. Iodate of hydriodate 71. Iodide of hydriodate 71. Iodine 615; resublimed 31. Iodoform 32. Ipecac 616. Iridium 617. Iron, anchors 153; andirons 161; articles 171; anvils 155; axles 154; band 140, 151; bars 136, 152; barrel hoops 140; billets 136; blooms 136; boiler 138; bolts 158; bolt blanks 158; brads 177; chains 164; chromate of 132; card clothing 159; castings 161; cast pipes 160; cast vessels 161; cloths 148; cold hammered 152; cold rolled 152; copperas of 23; crowbars 156; enameled 171; flats 135; flues 157; forgings 139, 153; glazed 171; hammered 135; hinges 158; hoop 140, 151; in bars 136; in blooms 136; in loops 136; in other forms 136; in pigs 134; in slabs 136; Kentledge 134; malleable castings 162; manufactures 133; molded steel casting 146; ore 133; pipes 159; plate 138; rivets 182; rods 152; rolled 135; sad-irons 161; scroll 140, 151; sheet 145, 171; sledges 156; sizes or shapes 136; springs 177; sulphuret of 133, 727; tempered 152; track tools 156; tubes 157; wares 171, 172; wares, ornamented 172; wheels 154, 185; wire 147; wire, covered 148; wire rods 147; wire rope 148; or steel flat rails, punched 141; or railway bars 141; or steel sheets or plates 143; or steel taggers 145; or steel sheets, common or black 142. Irons, hatters' 161; tailors' 161. Isinglass 27. Istle 592. Italian cloths 394, 395. Ivory 618; black 52; buttons 430; dice 435; manufactures 462.

JACKETS 397. Jalap 619. Japanned, calf skins 456; leather 456. Jasmine oil 661. Jet 452, 620. Jet paste 459. Jewels 557. Jewelry 452. Joists 137. Joss light 621; stick 621. Juice, cherry 339; prune 339. Juniper oil 661. Jungleanduem oil 661. Junk 622. Jute 593; bagging 366; burlaps 364; butts 594; butts, bagging 366; carpets 363; carpetings 363; linen hydraulic hose 368; manufactures of 374.

KAINITE 625. Kangaroo skins 456. Kaolin 98. Kelp 623. Kid gloves 458; skins 456. Kieserite 624. Kirschwasser 332. Kitchen knives 167. Knit fabrics 392. Knitting needles 178. Knives, artists' 167; bread 167; butchers' 167; butter 167; carving 167; print 167; kitchen 167; painters' 167; plumbers' 167; table 167. Kryolith 550. Kyanite 625.

LACES 373, 398, 413, 518. Lace window curtains 373. Lac 626; spirits 627. Lactarine 628. Ladies' lamb gloves 458; kid gloves 458; leather gloves 458; schmaschen gloves 458; suede gloves 458. Lahn 737. Lakes, paints 6. Lame 737. Lamb skins 456. Lamp black 52. Lancewood 756; sawed boards 220; sawed planks 220; sawed deals 220; sawed, all forms 220. Lard 314. Last-blocks 223. Laths 224. Laudanum 48. Lava 629. Lava tips 101. Lavender oil 661. Lead bars 200; brown, acetate of 62; dross 199; glaziers' 201; nitrate of 64; old 200; ore 199;

pencils 466; pigs 200; pipe 201; red 66; scrap 200; sheets 201; shot 201; white 67; white, acetate of 62; wire 201. Leaves 24, 560. Leaf, gold 197; silver 198; tobacco 242, 243; tobacco, stemmed 243; tobacco, unstemmed 243. Leather 455; bend or belting 455; boots 456; enameled 456; gloves 458; japanned 456; ladies gloves 458; manufactures 461; patent 456; piano forte action 456; shoes 456; shoe uppers 457; sole 455; vamps 457. Leeches 630. Lees, crystals 91. Leicester wool 377. Lemons 301. Lemonade 340. Lemon juice 631; peel 305, 661; oil 661. Lenses 120; glass 122; pebble 122. Libraries 516. License for sugar bounty 232. Lichens 24, 560. Licorice, extracts of 33; other forms 33; in paste 33; in rolls 33; root 632. Life saving apparatus 633. Lignum-vitæ 756; sawed boards 220; sawed planks 220; sawed deals 220; sawed, all forms 220. Lily of the valley 666. Lime 96, 634. Limes 301. Lime, borate of 14; glass bottles 10; juice 631; oil 661; stone 127, 128; sulphate of 680. Linconshire wools 377. Lined gloves 458. Linen hydraulic hose 368. Linoleum 369. Linseed 285. Linseed oil 41. Liquors 332, 333; coloring 22. Litharge 63. Litmus 637. Lithographed plates 180; prints 515; prints, stone or zinc 420; stones 636. Live poultry 315. Loadstones 638. Loam 146. Logo 754. Logwood, decoctions of 26; extracts of 26. Looking-glass plates 116, 117. Lumber, sawed, n. o. p. 218; planed or finished 218; tonged and grooved 218; how estimated 218; foreign duty, how affects 218; hemlock 218; sycamore 218; white pine, 218; whitewood 218; basswood 218.

MACARONI 258. Mace 717. Mace oil 661. Machinery, sugar 237. Mackerel, pickled or salted 292. Madder 639. Magnesia, calcined 34; carborate of 34; medical 34; sulphate of 34. Magnesium 641. Magnesite 640. Magnets 642. Mahogany 756; sawed boards 220; sawed planks 220; sawed deals 220; sawed, all forms 220. Maize 256. Malt extract 338. Manna 644. Manganese 643. Maganiferous iron ore 133. Mangel-wurzel seed 699. Manilla 595. Manufactures, aluminum 215; copper 215; cotton 355; down 443; flax 371; gold 215; hemp 371; iron 215; jute 374; lead 215; metal 215; nickel 215; pewter 215; platinum 215; silver 215; steel 215; tin 143; tin coated 143; zinc 215; vegetable fiber 374. Manufactured tobacco 244, 245; cigars 246; cigarettes 246; cheroots 246. Manufactures of paper n. o. p. 425; paper c. v. n. o. p. 425. Manure 600. Manuscripts 645. Maps 423, 512, 514, 515. Maple sap 233, 234. Marble 123; casts 677; dressed 124; manufactures 125; sawed 124; veined 124; paving tiles 124. Marbles, toys 436. Marrow 646. Marsh-mallows 647. Masks 463. Mats 408. Matting 464, 575. Matches, friction or lucifer 441. Meat, extract of 313. Medicinal preparations 74, 75. Manufactured cork 434; emery 437. Meats, prepared 312; preserved 312. Medals 648. Medical magnesia 34. Meerschaum 649. Melada 726. Men's hats 451; leather gloves 458. Merino wools 376. Mestiza, or metis, or metz 376. Metal 150; britannia 676; Dutch 190; thread 196; yellow 190. Metallic pins 206. Metals, unwrought 202. Mica 202. Mill cranks 153; irons 153; stones 126, 723. Millinery ornaments 504. Milk 268; preserved or condensed 269; of india rubber 613; sugar of 269. Mule shoes 176. Minerals 651. Mineralogy, specimens of 712. Mineral, orange 65; substances 202; water 341; waters 650. Mirrors, hand 122; pocket 122. Models 652. Molasses 726. Mold gun barrel 146. Monumental stone 127, 128. Moquette carpets 399. Morphia or morphine 35. Morphine or morphia 35. Morphia, salts of 35. Moss 653. Mosses 24, 560. Mother of pearl, manufactures 462. Movements, watch 211. Mules 247. Mungo and flocks 389. Muriate of ammonia 10; of potash 685. Mushrooms, prepared or preserved 271. Musk 654; pods 654. Muskets 169. Mustard, ground 325; preserved 325; seed 699. Mutton 311. Myrobolan 655. Myrtle wood 756.

NAILS 173; cut 173; hob 174; horse shoe 174; rods 147; steel 174; wrought iron 174; wire 175. Natural history specimens 712; mineral waters 341. Neck rufflings 373, 413. Neckties, cotton 349. Neck-wear 349. Needles 178, 179, 656. Neroli oil 661. Nets, flax 367. Newspapers 657. New types 208. New Zealand wool 376. Nickel 203; alloy 203; matte 667; ore 667; oxide 203. Nitrate of lead 64; of potash 685; saltpeter, refined 72; soda 709. Niter cake 85. Nitrous ether, spirits of 25. Noils 388. Nuts 24, 176, 306, 307, 308, 309, 560;

Brazil 583; cream 584; oil of 661; palm 585. Nut galls 560. Nutmegs 718. Nursery stock 682. Nux vomica 658.

OAKUM 659. Oar blocks 223. Oats 259. Oatmeal 260. Ocher 54. Ochery earths 54. Oils 599, 661; almond 661; amber 661; ambergris 661; aniline 661; anise 661; anthoss 661; aspic 661; bergamot 661; cake 660; cajeput 661; caraway 661; cassia 661; castor 37; cedrat 661; chamomile 661; cinnamon 661; civet 661; citronella 661; cocoanut 661; cod liver 38; cotton seed 39; croton 40; distilled 76; essential 76; expressed 76; fennel 661; fish 661; flaxseed 41; fruit 25; fusel 42; hemp seed 43; herring 46; jasmine 661; juniper 661; juglandium 661; lavender 661; lemon 661; limes 661; linseed 41; mace 661; neroli 661; olive 44, 661; orange flower 661; origanum 661; ottar of roses 661; oil of nuts 661; oil palm 661; peppermint 45; poppy seed 41; rape seed 43; rosemary 661; seal 46; sesamum seed 661; spermaceti 661; spike lavender 661; thyme 661; Turkey red 36; valerian 661; vitriol 5; whale 46, 661. Oil cloth 369; paintings 465. Old lead 200; zinc 214. Oleate of soda 36. Olives 662. Olive oil 44, 661. Onions 280. Opium 663; aqueous extract of 47; containing less than 9 per cent. of morphia 48; for medicinal uses 47; prepared for smoking 48; tincture of 47 Ore 539; chromic 132; copper 192; emery 562; gold 667; iron 133; lead 199; nickel 667; silver 667; sulphur 133, 727; tin 736. Oranges 301. Orange flower oil 661; mineral 65; peel 305, 664; wood 756. Orchids 666. Orchil 665. Origanum oil 661. Organzine 410. Oriental carpets 399; rugs 399; Orleans 484. Ornaments 100, 412. Ornamental feathers 443. Orpiment 489. Osier 459. Osmium 668. Ottar of roses, oil 661. Outside garments 397. Oxide of cobalt 20; nickel 203; uranium 726; strontia 725; tin 736; zinc 60. Ox shoes 177.

PADDY 261. Packing boxes 228; box shooks 228. Paints and colors 61; lakes 61. Paintings 465, 677. Painters' knives 167. Paint, white containing zinc 60. Palette 167. Palladium 669. Palings 225. Palms 666. Palm nuts 585; leaf 564; leaf, manufactures 460; nut kernels 586; oil 661. Pamphlets 423. Papier mache, manufactures 461. Paper, sheathing 416; printing, unsized 417; printing, sized or glued 418; copying 419; filtering 419; silver 419; tissue 419; copy books 419; reams 419; albumenized 419; sensitized 419; surface coated 420; manufactured 420; card boards 420; albums 420; envelopes 421; hangings 422; screens 422; fireboards 422; writing 422; drawing 422; all n. o. p. 422; manufactures of n. o. p. 425; shoe-buttons 431; stock 670. Paraffine 671. Parasols 470; sticks 471, 756. Parchment 672. Parian 100; toys 436. Paris white 59. Parts of chronometers 210; or sections of posts 137; or sections of columns 137; of watches 211. Paste, manufactures of 459. Pastes 77; of indigo 29. Patent alum 9; barley 254; leather 456; tartar 90. Paving posts 219. Pearls 452, 453. Pearled barley 254. Pearl buttons 429; mother of 670. Pease 281; dried 281; green 281; prepared or preserved 271; split 281. Peanuts 307. Peltries 674. Pens 204; gold 205. Penalty for refining sugar 236. Pencils 467; hair in quill 427. Pen holder tips 204; holders 205; knives 165. Pencil leads 466. Pepper 719; cayenne 326; cayenne unground 326. Peppermint oil 45. Percussion caps 442 Perfumery, alcoholic 8. Perfumed soap 79. Periodicals 657. Personal effects 675, 752. Pewter 676. Philosophical apparatus 677, 758. Phosphates 678. Phosphorus 68. Photographs 423, 512, 514; albums 420. Pianoforte leather 456. Pickles 287. Pickled fish 292, 293; or salted herrings 294; or salted mackerel 292; or salted salmon 292. Pickets 225. Pig lead 200; tin 209. Pile fabrics 350, 396, 411. Pimento 720. Pine clapboards 221. Pins 206; belt 206; bonnet 206; hair 206; hat 206; safety 206; shawl 206; wrist or crank 146. Pipes 468, bowls 468; copper 195; lead 201. Pique gloves 458. Piston rods 146. Pistols 170. Pitch 731. Plaits 518. Placques 100. Planished sheet steel 144; sheet iron 144. Planks 218. Plants 282, 666, 679. Plaster of Paris 97, 680; calcined 97; casts 677. Plates 146; electrotype 180; iron 138; lithographed 180; or sheet or taggers iron or steel 144; steel 138, 180; stereotype 180; terne 143, 145; tin 143, 145. Platina, 681. Platinum 682. Playing cards 424. Plumbago 683. Plumbers' knives 167. Plushes 350, 396, 411, 469. Pocket mirrors 122. Porcelain 100, 110; toys 436. Polishing stones 684. Polished sheet steel 144; sheet iron 144. Poles, telephone and telegraph 219. Pomades 77. Pool balls 435.

Poppy seed 285; seed oil 41. Portions of carpets n. o. p. 408. Portland cement 95. Pork 311. Porter 337. Posts 137, 223. Potash 685; bichromate of 69; carbonate of 685; caustic 70, 685; chromate of 69; chlorate of 685; hydrate of 70; muriate of 685; nitrate of 685; refined 70; sulphate of 685. Potassa, tartarate of 92. Potatoes 283. Poultry 315; dressed 315; live 315. Powders 77; fulminating 439. Powdered spices 326. Precious metals 452; imitations of 452; stones 452. 454, 557; imitations of 452. Precipitated chalk 16. Prepared acorns 321. Preparations, alcoholic 331. Prepared or preserved beans 271; chalk 16; cocoa 329; dandelion root 321. Preparations of, anatomy 707; coal tar 19. Prepared or preserved mushrooms 271. Preserved mustard 325. Preserved or condensed milk 269 Prepared or preserved pease 271; or preserved vegetables 287. Pressed glassware 104; shapes 146. Prick seam gloves 458. Printers' ink 30. Printed matter, all n. o. p. 423. Printing paper, unsized 417; sized or glued 418. Professional books 686. Proxtoxide of strontian 725. Prune juice 339. Prussian blue 50. Prussiate of red 73; of yellow 75. Pulp shoe bottons 431; manufacture 461; wood 515. Pulu 687. Pulverized emery 437. Pumice 688; stone 723. Punched iron or steel, flat rails 141. Pyrites 133, 727. Pyroligneous acid 1.

QUICKSILVER 207. Quills 689; of down 443. Quinia, sulphate of 690. Quoits 552.

RAGS 670, 691. Rags, woolen 389. Railroad ties 219. Railway bars 141; bars of steel 141; fish plates 181. Railroad ties 755. Raisins 302. Rape seed 699; seed oil 43. Rasps 168. Ratafia 332. Rattan 756. Raw hides 665; silk 704. Razors 165. Razor blades 165. Reams 419. Ready made clothing 396. Red chalk 16; lead 66. Reeds 756; chair 229. Refined emery 437; borax 14; camphor 15; glycerine 28; sulphur 88. Refuse iron 134; steel 134. Refunds on machinery 237. Regalia 692. Regulus 187; of copper 193. Rennets 693. Resublimed iodine 31. Revolvers 170. Rice 261; broken 261; flour 261; meal 261. Rifles, sporting 169. Ring waste 388. Rivets 182. Rivet rods 147. Roasted chicory root 317. Rochelle salts 92. Rods, copper 195; fence wire 147; iron 152; round iron 136; nail 147; rivet 147. Rolled iron shapes 136; collodion 21; iron 135; iron bars 136. Roman cement 95. Roots 24, 560 679. Root, chicory 317. Rope ends 670. Roping, roving or tops 390. Rope, wire 148. Rosemary oil 661. Rosewood 756; sawed boards 220; sawed planks 220; sawed deals 220; sawed, all forms 220. Rotten stone 723. Roucou 484. Round iron 135; iron coils 136; iron rods 136. Roving waste 388. Rubber and cotton clothing 249; toys 436. Rubies 452. Ruchings 373, 413. Rugs 399, 408. Russian camels' hair 378. Russia wool 376. Rye 262; flour 263.

SALACINE 696. Sal-ammoniac 10. Sad irons 161. Safety pins 206. Safflower 694. Saffron 694. Sago 695. Sago flour 695. Saleratus 80. Salmon, pickled or salted 292. Saloup 700. Sal-soda 83. Salt 322. Salts, aniline 481. Salt cake 85. Salts, Epsom 34. Salted fish 293; guts 602. Saltpeter 685; refined, nitrate of 74. Salts, Rochelle 92; of cinchona bark 690; morphia 35; santonine 78; strychnine 87; uranium 746. Sand 723; dry 146. Sandstone 127, 128. Sardines 291. Satin, white 51; wood 756. Sauces 287. Saur-kraut 697. Sausage skins 698. Santonine 78; salts of 78. Saws 183. Sawed boards 218; deals 218; planks 218; timber 216. Saw plates 146, 152. Saxony carpets 400. Scientific apparatus 677, 758. Scoured wools, how dutiable 381. Scrap albums 420; iron, wrought 154; iron, cast 134; lead 200; steel 134. Screens 408; paper for 422. Screws 184. Screw rods 147. Scroll iron 140, 151; iron or steel 143; steel 140. Seal oil 46. Sea weeds 653. Seeds 286, 679, 699; agricultural 286; aromatic 560; oil 285; castor 284; of morbid growth 24. Seed, anise 699; caraway 699; canary 699; cardamom 699; cotton 699; coriander 699; cinnamon 699; fennel 699; fenugreek 699; flower 699; grass 699; hoarhound 699; mangel-wurzel 699; mustard 699; poppy 285; rape 699; sugar beet 699; sugar cane 699. Seines, flax 367. Selep 700. Sensitized paper 419. Sesamum-seed oil 661. Sewing machine needles 178; silk 410. Shafting 146. Shafts, crank 146; steamer 146. Shale coal 432; Shapes, pressed 146; rolled iron 136; sheared 146; stamped 146. Shavings 670. Shawl pins 206. Shawls, woolen or worsted 392. Sheared shapes 146. Sheathing paper 416.

Sheep 250; skins, bookbinders' 456. Sheets 146. Sheet iron 171; iron glanced 144; polished 144; iron planished 144; lead 201. Sheets or plates of iron 145; of iron or steel, common or black 142; or plates, steel 145. Sheet steel 148, 171; steel glanced 144; steel planished 144; steel polished 144. Sheets, zinc 213. Shells 701; buttons 429; fish 296, 703. Shell mnfs. 462. Shingle bolts 755. Shingles, white pine 226; other 226. Ship planking 755; timber 755. Shirts 272; cotton 352, 353. Shoddy 388. Shoe buttons, board 431; papier mache 431; paper 431; pulp 431. Shoe lacings, cotton 354; uppers, leather 457. Shoes, leather 456. Shooks 228. Shot 201. Shotguns 170. Shotgun barrels 702. Shrimps 703. Shrubs 282, 679. Side arms 166. Sided timber 217. Sides, bed 408. Sienna 54; earths 54. Silicate of soda 84. Silk 704; carded 909; combed 409; partially manufactured 409; clothing, ready made 413; wearing apparel 413; knit goods 413; and India rubber 413; all manufactures n. o. p. 414; and wool, etc. 414; pile fabrics 411; plushes 411; threads 410; waste 705; webbings 412. Silk, gorings 412; suspenders 412; braces 412; beltings 412; bindings 412; braids 412; galloons 412; fringes 412; cords and tassels 412; buttons 412; ornaments 412; laces 413; embroideries 413; handkerchiefs 413; neck rufflings 413; ruchings 413; worm eggs 766. Silver bullion 522; German 188; leaf 198; ore 667; paper 419; sweepings 729; thread 196. Singles 410. Sisal grass 596. Satinwood, sawed boards 220; sawed planks 220; sawed deals 220; sawed all forms 220. Skeletons 707. Skelp iron 138; iron or steel 142; steel 138. Skins 456; calf, tanned 456; chamois 456; fish 573; fur 588; for morocco 456; gold beaters' 598; wools on the 387. Skirted wool 383. Slabs 146. Slack coal 432. Slates 130. Slate, chimney pieces 130; mantles 130; roofing 131; slabs 130. Sledges 156. Slubbing waste 388. Smalts 61. Smokers' articles 468. Smoked fish 293. Smoking tobacco pouches 468. Smoothed iron or steel 144. Snails 708. Snuff, snuff flour, al. 245. Soap 79; castile 79; perfumed 79. Soda, ash 83; bicarbonate of 80; bichromate of 82; borate of 14; caustic 81; chlorate of 709; chromate of 82; hydrate of 81; nitrate of 709; oleate of 36; silicate of 84; sulphate of 85; supercarbonate of 80; tartarate of 92; water 340; crystals 83. Sodium 710. Sole leather 455. Soluble oil 36. Sorghum 233, 234. Sour orange juice 631. South American native wool 378. Spar 459. Sparkling wine 335. Sparterre 711. Spar timber 216. Specimens of sculpture 692. Spectacles 119. Spectacle lenses 121. Spermaceti oil 661. Spices 24, 326, 560. Spiegeleisen 134. Spikes 176; cut 173. Spike lavender oil 661. Spirits, compounds 331; distilled 329, 330, 333; of nitrous ether 25; preparations 331. Spirituous beverages 332. Spirit varnishes 56. Split peas 281. Sponges 86. Spool thread 343. Sprigs, iron 177. Spunk 722. Spun silk 410. Spruce clapboards 221. Spurs 722. Squares, art 408. Square iron 135. Squared timber 217. Stamped shapes 146. Standard samples of wool 379. Starch 323; burnt 324; preparations 323. Statuary 465, 677, 692. Statuettes 100. Staves 227. Stave bolts 755. Stays 157. Steamer shafts 146. Steel anchors 153; anvils 155; band 140; barrel hoops 140; boiler 138; castings, iron molded 146; circular saw plates 152; cloths 148; crowbars 156; forgings 139, 153; hinges 158; hoop 140; in forms 146; ingots 146; in shapes 146; plate 138; plates 180; railway bars 141; rivets 182; scrap 134; scroll 140; sheet 148, 171; sheets or plates 145; spikes 173; wheels 185; wire 147; wire rods 147; wire rope 148. Stems 24. Stereotype plates 180. Sticks, all 223; for canes 756. Still wines 336. Stilts 722. St. John's bread 699. Stockings, cotton 352, 353. Stone 723; building 127, 128; burr 126, 723; cliff 723; monumental 127, 128; pumice 723; rotten 723. Stones, mill 723; polishing 684. Stoneware 100; common 99; toys 436. Storax 724. Stove plates 161. Straw 289; manufactures of 460; flax 356. Strontia 725. Strontiate 725. Structural shapes of iron 137; steel 137. Strychnine salts of 87. Strychnia 87. Stuffed birds 504. Styrax 724. Sublimed sulphur 88. Sugars 726; duty on, retaliation 237. Sugar beet seed 699; bounty on 231; box shooks 228; candy 238; cane 233, 234; cane seed 699; draining 726; of milk 269; sweepings 726; when bounty provisions take effect 241; when may be refined in bond 241; when transported 241. Sulphate of alumina 9; of ammonia 10; baryta 49; copper 12; iron 23; lime 680; magnesia 34; potash 685; soda 85; quinia 690. Sulphide of arsenic 489. Sulphite of antimony 485. Sulphur 727; flowers of 88; ore 133, 727; refined 88; sublimed 88. Sulphuret of iron 133, 727

Sulphuric acid 5, 728; ethers 25. Sumac, extracts of 26; ground 89. Sunn 397. Sun-shades 470; sticks 471. Supercarbonate of soda 80. Surface coated papers 420; manufactures of 420. Suspenders 398, 354, 412. Swaged steel 146. Sweetmeats 303. Swords 166. Sycamore boards, planks and deals 218; lumber 218. Syrup of cane juice 726.

TABLE covers, cotton 351; forks 167; knives 167. Tacks 177. Taggers tin 143, 145; iron or steel 145. Tailors' irons 161. Talmas 397. Tallow 316. Tamarinds 581. Tampico fiber 592. Tannin acid 6. Tank bottom 726. Tape needles 178. Tapered bars 146. Tapestry Brussels carpets 403; velvet 402. Tapioca 730. Tar 731. Tarred cables 362; cordage 362. Tartars 91; acid 7; cream of 90; crude 487; patent 90. Tartarate of potassa 92; of soda 92. Tea 732; plant 732. Teazles 290. Teeth 733. Telegraph poles 219. Telephone poles 219. Tempered iron 152. Temporary exhibition, articles for 758. Terra alba 734; japonica 735; plates 143, 145, 151. Textile grasses, 597. Third-class wools 385, 386. Thread, cotton 342, 343; of flax 370; gold 176; silver 196. Thrown silk, floss 410; organzine 410; sewing silk 410; singles 410; silk threads 410; spun 410; twist 410; tram 410. Thyme oil 661. Ties 140; railroad 210. Tiles 94; marble 124. Timber 754; hewn and sawed 216; used for spars 216; used for building wharves 216; squared or sided 217. Tin, bar 209, 736; blocks 209, 736; cassiterite 209; coated vessels, etc., 143; ore 736; oxide 736; pig 209, 736; plates 143, 145, 151; taggers 143, 145. Tinsel wire 737. Tips, lava 101. Tissue paper 419. Tobacco, leaf for wrappers 242; leaf unmanufactured 243; leaf manufactured 244; stems 738. Toilet preparations 77; soap 79; waters 8. Tonka beans 739. Tonics 77. Tonquin 739. Tools 686. Top-waste 388. Tournay velvet carpets 400. Tow, flax or hemp 359. Toys 100; bisque 436; China 436; earthenware 436; marbles 436; Parian 436; porcelain 436; rubber 436; stoneware 436. T T columns 137. Tubes, boilers 157. Tuckings 373. Tumeric 741. Turkey red oil 36. Turpentine 742; spirits of 743. Turtles 744. Track tools 156. Tram 410. Treble ingrain carpets 404. Trails 141. Trees 282, 619. Trimmings 373; dress 398. Tripoli 740. Trophies 648. Twine 362; binding 362; Istle 362; Tampico fiber 362; manilla 362; sisal grass 362; sunn 362. Twist 410. Types 745. Type metal 208. Types, new 208.

ULSTERS 397. Ultramarine blue 55. Umber 54; earths 54. Umbrellas 470; sticks 471, 756. Underwear, flannels for 393. Unmanufactured leaf tobacco 243. Unwashed wools, defined 382. Upper leather, dressed 456. Uranium 746.

VACCINE virus 747. Valerian oil 661. Valonia 748. Valparaiso wool 378. Vamps, leather 457. Varnishes 56. Vases 100. Vegetables 24, 560. Vegetable black 52; fiber, manufactures of 374; ivory 618; ivory buttons 430; ivory mnfs. 462; natural 288; prepared or preserved 287. Vellum 672. Velvets 411; cotton 350. Velveteens, cotton 350. Velvet and tapestry velvet carpets 402. Verdigris 749. Vermilion red 57. Vermicelli 258. Vermuth 336. Vessels, tin coated 143. Vines of all kinds 282. Vinegar 327. Vitriol, oil of 5.

WAFERS 750. Wagon blocks 223. Walnuts 307. Waste 472, 670. Waste bagging 670; iron 134; steel 134; garnetted 388; ring 388; roving 388; slubbing 388; top 388; yarn 388; others composed of wool 388; rope 670. Washers 176. Wash blue 58. Washed wool, defined 382; wools, how dutiable 381. Watches 211. Watch cases 211; glasses 211; movements 211; Water colors 465; proof cloth 369. Waters, toilet 8. Wax 459, 751. Wearing apparel 349, 372, 396, 752 Webbings 398, 412. Webbing, cotton 354 Webs flax 367. Weeds 24, 560; Wharf timber 216. Whalebone 753; manufactures of 460. Whale oil 46, 661. Wheat 264; flour 265. Wheels 154, 185. Whetstones 608. Whip gut 459, 529; sticks 756. White lead 67. White paint containing lead 67; zinc 60. White pine, sawed boards, planks and deals 218; lumber 218; shingles 226. Whiting 59. Whitewood lumber 218; sawed planks, boards and deals 218. Willow 459. Wilton carpets 400. Window glass, stained 122; glass, painted 122. Wines 335, 336. Wine coloring 22. Wines, sparkling 335. Wire crinoline 148; corset 148; fencing 147; hat 148; iron 148; lead 201; nettings 148; rods 147; rope 148; steel 147; tinsel 737. Wool Dutch carpets 405; carpets, n. o. p. 407; grease 316;

highest rate, when 383; braces 398; braids 398; beltings 398; bindings 398; barrel buttons 398; buttons 398; gorings 398; headnets 398; cords 398; cords and tassels 398; embroideries 398; dress trimmings 398; laces 398; gimps 398; galloons 398; suspenders 398; webbings 398; garments, outside 397; ulsters 397; talmas 397; jackets 397; dolmans 397; cloaks 397; pile fabrics 396; plushes 396; felts 396; wearing apparel 396; clothing 396; dress goods 394, 395; coat trimmings 394 395; Italian cloth 394, 395; flannels 393; hats 393; blankets 393; manufactures, n. o. p. 392; knit fabrics 392; shawls 392; cloths 392; yarns 391; roppings 390; rovings 390; tops 390; manufactures of 390; flocks 389; mungo 389; rags 389; waste all 388; noils 388; claimed to be shoddy 383; claimed to be mungo 383; claimed to be flocks, etc. 383; and hair, first-class, duty on 384; and hair, second-class, duty on 384; sorted, no double duty 383; washed, defined 382; other than ordinary condition 383; standard, sample of 379. Wools or skin 387; etc., as manufactures of 390; class one, how dutiable 381; class one 376; class two 377; class three 378; of class three improved 380; Cordova 378; Donskoi 378; Smyrna 378; Valparaiso 378; how divided 375; washed, how dutiable 381; improved, how classified 380; imported from Egypt 378; imported from Greece 378; imported from Syria 378; scoured, how dutiable 381; skirted 383; third class, duty on 385, 386; unwashed, defined 382. Women's and children's dress goods 494, 395. Wool, etc., all manufactures n. o. p. 392. Worsted cloths 392; Wool knit fabrics 392. Woolen shawls 392. Worsted shawls 392. Woolen or worsted cloths 392; yarns 391. Wood 754. Woods 756; for dyeing 24; manufactures 461; screws 184; pulp, mechanically ground 415; chemical 415; unbleached 415. Worm gut 459, 529. Women's hats 451. Worn out zinc 214. Wrappers, cigars 242. Wrist or crank pins 146. Writing paper 422. Wrought iron stays 157; scrap iron 134.

YARNS 391, 760; cotton 342; waste 388. Yarns of flax 370; of hemp 370; made of jute 361. Yellow metal 189. Yolks of eggs 276.

ZAFFER 761. Zinc 60; in blocks or pigs 212; sheets 213; old 214; oxide of 60.

VALUE OF FOREIGN COINS.

Proclaimed by law, January 1, 1891.

Country.	Monetary Unit.	Standard.	Value in U. S. Money.
Argentine Republic	Peso	Gold and silver	$ .96 5/10
Austria	Florin	Silver	.38 1/10
Belgium	Franc	Gold and silver	.19 3/10
Bolivia	Boliviano	Silver	.77 1/10
Brazil	Milreis	Gold	.54 6/10
Canada	Dollar	Gold	1.00
Chili	Peso	Gold and silver	.91 2/10
China	Tael	Silver	1.27
Cuba	Peso	Gold and silver	.92 6/10
Denmark	Crown	Gold	.26 8/10
Ecuador	Peso	Silver	.77 1/10
Egypt	Piaster	Gold	.04 9/10
France	Franc	Gold and silver	.19 3/10
Great Britain	Pound St'g	Gold	4.86 6/100

Country.	Monetary Unit.	Standard	Value in U. S. Money.
Greece	Drachma	Gold and silver	.19 3/10
German Empire	Mark	Gold	.23 8/10
Hayti	Gourde	Gold and silver	.96 5/10
India	Rupee	Silver	.36 6/10
Italy	Lira	Gold and silver	.19 3/10
Japan	Yen	Silver	.85 8/10
Liberia	Dollar	Gold	1.00
Mexico	Dollar	Silver	.83 7/10
Netherlands	Florin	Gold and silver	.40 2/10
Norway	Crown	Gold	.26 8/10
Peru	Sol	Silver	.77 1/10
Portugal	Milreis	Gold	1.08
Russia	Rouble	Silver	.61 7/10
Sandwich Islands	Dollar	Gold	1.00
Spain	Peseta	Gold and silver	.19 3/10
Sweden	Crown	Gold	.26 8/10
Switzerland	Franc	Gold and silver	.19 3/10
Tripoli	Mahbub	Silver	.69 5/10
Turkey	Piaster	Gold	.04 4/10
U. S. of Colombia	Peso	Silver	.79 5/10
Venezuela	Bolivar	Gold and silver	.15 4/10

SOME FACTS WORTH KNOWING.

The Capital of the United States has been located at different times at the following places: At Philadelphia from Sept. 5, 1774, until Dec., 1776; at Baltimore from Dec. 20, 1776, to March, 1777; at Philadelphia from March 4, 1777, to Sept., 1777; at Lancaster, Pa., from Sept. 27, 1777, to Sept. 30, 1777; at York, Pa., from Sept. 30, 1777, to July, 1778; at Philadelphia from July 2, 1778, to June 30, 1783; at Princeton, N. J., June 30, 1783, to Nov. 20, 1783; Annapolis, Md., Nov. 26, 1783, to Nov. 30, 1784; Trenton from Nov., 1784, to Jan., 1785; New York from Jan. 11, 1785, to 1790; then the seat of government was removed to Philadelphia where it remained until 1800, since which time it has been in Washington.

Tomato in Bright's Disease. When Thomas Jefferson brought the tomato from France to America, thinking that if it could be induced to grow bountifully it might make good feed for hogs, he little dreamed of the benefit he was conferring upon posterity. A constant

diet of raw tomatoes and skim-milk is said to be a certain cure for Bright's disease. Gen. Schenck, who, when Minister to England, became a victim to that complaint, was restored to health by two years of this regimen. With many persons the tomato has much the same effect upon the liver as a small blue pill, and whether it is as a people we are less bilious than in former years, or that the doctors of the new school practice less severe remedies than did those of the past, it is certain that mercury is prescribed with less frequency than of old.

Asthma. I have been a sufferer from asthma for twenty-five years, and for more than a dozen years have used the following recipe with great benefit. It is not a cure, but in my case gives almost instant relief. Take equal parts of powdered stramonium leaves and powdered belladonna leaves and mix thoroughly; to each ten ounces of the mixture add one ounce of powdered saltpeter (nitrate of potash); mix all thoroughly. I always keep some of this in a small tin box. When I wish to use it I pour a little of the powder into the cover of the box, light it with a match, cover the whole with a little paper cone with the point cut off. I place the point of the cone in my mouth, and breathe the smoke into my lungs with the air. The first trial is very hard, it almost strangles, but if persevered in will give great relief. This is much better than stramonium alone. The saltpeter makes it burn freely, and also helps to give relief.

When my home was in northern Indiana, I used to buy the leaves in Chicago already powdered. Now I send to New York. I find it cheaper to do this than to gather and dry the leaves. It is also almost impossible to dry and pulverize the leaves at home. By using a paper cone and breathing through it, little or no smoke is wasted, and the box and paper can be carried in the pocket and used as occasion requires.

For Swollen Feet. Policemen, mail carriers, and others whose occupation keeps them on their feet a great deal, often are troubled with chafed, sore and blistered feet, especially in extremely hot weather, no matter how comfortably their shoes may fit. A powder is used in the German army for sifting into the shoes and stockings of the foot soldiers, called "Fusstreupulver," and consists of 3 parts salicylic acid, 10 parts starch and 87 parts pulverized soapstone.

Rules for Fat People and for Lean. To increase the weight: Eat to the extent of satisfying a natural appetite, of fat meats, butter, cream, milk, cocoa, chocolate, bread, potatoes, peas, parsnips, carrots, beets, farinaceous foods, as Indian corn, rice, tapioca, sago, corn starch, pastry, custards, oatmeal, sugar, sweet wines, and ale. Avoid acids. Exercise as little as possible, and sleep all you can.

To reduce the weight: Eat, to the extent of satisfying a natural appetite, of lean meat, poultry, game, eggs, milk moderately, green vegetables, turnips, succulent fruits, tea or coffee. Drink lime juice, lemonade, and acid drinks. Avoid fat, butter, cream, sugar, pastry,

rice, sago, tapioca, corn starch, potatoes, carrots, beets, parsnips, and sweet wines.

Wonders of the Human Body. The skin contains more than two million openings, which are the outlets of an equal number of sweat-glands. The human skeleton consists of more than two hundred distinct bones. An amount of blood equal to the whole quantity in the body passes through the heart once every minute. The full capacity of the lungs is about three hundred and twenty cubic inches. About two-thirds of a pint of air is inhaled and exhaled at each breath in ordinary respiration. The stomach daily produces nine pounds of gastric juice for digestion of food; its capacity is about five pints. There are more than five hundred separate muscles in the body, with an equal number of nerves and blood-vessels. The weight of the heart is from eight to twelve ounces. It beats one hundred thousand times in twenty-four hours. Each perspiratory duct is one-fourth of an inch in length, of the whole about nine miles. The average man takes five and one-half pounds of food and drink each day, which amounts to one ton of solid and liquid nourishment annually. A man breathes eighteen times a minute, and three thousand cubic feet, or about three hundred and seventy-five hogsheads of air every hour of his existence.

Changes in the Language. Few, scholars even, are aware of the great changes through which the English language has passed in successive centuries. Following are specimens of the Lord's Prayer as used at various periods in English history:

A. D. 1158.—Fader ur heune, haleweide beith thi neune, cumin thi kuneriche, thy wille beoth idon in heune and in erthe. The euryeu dawe briend, gif ous thilk dawe. And vorzif uer detters as vi yorsifen ure dettoures. And lene us nought into temtation, bot delyvor eus of evel. Amen.

A. D. 1300.—Fader ure in heavene. Halewyn be thi name, thi kingdom come, thy wille be done as in heavene and earthe—Oua urche days bred give us to daye. And forgive oure dettes as we forgive oure dettoures. And lead us nor in temptation, bote delyveor us of yvil. Amen.

A. D. 1370.—Oure fadir that art in heunes hallowid be thi name thi kingdom come to, be thi wille done in erthe as in heune, geve to, us this day oure breed *oure other substance* forgene to us our dettis as we forgauen to oure dettouris, lede us not into temptation; but delyeur us yvel. Amen.

A. D. 1524.—O oure father which arte in heven, hallowed be thy name. Let thy kingdom come. Thy wyoll be fulfilled as well in earth as it is in heven. Give us this daye oure dayly brede. And forgive us our trespaces even as we forgive our trespacers. And lead us not into temptation, but delyver us from vell. Fyr thyne is the kingdome and the power and the glorye for ever. Amen.

A. D. 1561.—Our father which art in heauen, sanctified be thy name. Let thy kingdom come. Thy will be done, as in heauen, in earth also. Give us today our superstantial bread. And forgive us our dettes as we forgive our detters. And lead us not into temptation. But delivere us from evil. Amen.

A. D. 1711.—Our father which art in heauen, hallowed be thy name. Thy kingdom come. Thy will be done in earth as it is in heauen. Give us this day our dayley bread. And forgive us our debts as we forgive our debtors. And lead us not into temptation, but deliver us from evil. For thyne is the kingdome, and the power, and the glory forever. Amen.

How to Put on Gloves. A great deal depends on the first puting on of gloves. Have the hands perfectly clean, dry and cool, and never put on new gloves while the hands are warm or damp. When a person is troubled with moist hands, it is well to powder them before trying on the gloves; but in most cases, if the hands are cool and dry, this is not needed. First, work on the fingers, keeping the thumb outside of the glove, and the wrist of the glove turned back. When the fingers are in smoothly, put in the thumb, and work the glove on very carefully; then placing the elbow on the knee, work on the hand. When this is done, smooth down the wrist, and button the second button first, then the third, and so on to the end. Then smooth down the whole glove and fasten the first button. Fastening the first button last, when putting on a glove for the first time, makes a great deal of difference in the fit, although it may seem but a very little thing. It does not strain the part of the glove that is easiest to strain at first, and prevents the enlarging of the button-hole, either of which is sure to take place if you begin at the first button to fasten the glove.

When removing your gloves, never begin at the tips of the fingers to pull them off, but turn back the wrist and pull off carefully, which will, of course, necessitate their being wrong side out. Turn them right side out, turn the thumbs in, smooth them lengthwise in as near as possible the shape they would be if on the hands, and place them away with a strip of white Canton flannel between if the gloves are light, but if dark-colored the flannel may be omitted. Never roll gloves into each other in a wad, for they will never look so well after. There is always some moisture in them from the hands; consequently, when rolled up, this moisture has no chance of drying, and must work into the gloves, making them hard and stiff, and of very little use after, as far as looks or fit is concerned.

When Quinine Will Break Up a Cold. It is surprising, says a family physician, how certainly a cold may be broken up by a timely dose of quinine. When first symptoms make their appearance, when a little languor, slight hoarseness and ominous tightening of the nasal membranes follow exposure to draughts or sudden chill by wet, five

grains of this useful alkaloid are sufficient in many cases to end the trouble. But it must be done promptly. If the golden moment passes, nothing suffices to stop the weary sneezing, handkerchief-using, red nose and woe-begone-looking periods that certainly follow.

A Mistaken Idea. The old adage, "Feed a cold and starve a fever," is characterized by the *Journal of Health* as very silly advice. If anything, the reverse would be nearer right. When a person has a severe cold it is best for him to eat very lightly, especially during the first few days of the attack.

Bathing. There has been a great deal written about bathing. The surface of the skin is punctured with millions of little holes called pores. The duty of these pores is to carry the waste matter off. For instance, perspiration. Now, if these pores are stopped up they are of no use, and the body has to find some other way to get rid of its impurities. Then the liver has more than it can do. Then we take a liver pill when we ought to clean out the pores instead. The housewife is very particular to keep her sieves in good order; after she has strained a substance through them they are washed out carefully with water, because water is the best thing known. That is the reason water is used to bathe in. But the skin is a little different from a sieve, because it is willing to help along the process itself. All it needs is a little encouragement and it will accomplish wonders. What the skin wants is rubbing. If you should quietly sit down in a tub of water and as quietly get up and dry off without rubbing, your skin wouldn't be much benefited.

The water would make it a little soft, especially if it was warm. But rubbing is the great thing. Stand where the sunlight strikes a part of your body, then take a dry brush and rub it, and you will notice that countless little flakes of cuticle fly off. Every time one of these flakes is removed from the skin your body breathes a sigh of relief. An eminent German authority contends that too much bathing is a bad thing. There is much truth in this. Soap and water are good things to soften up the skin, but rubbing is what the skin wants. Every morning or every evening, or when it is most convenient, wash the body all over with water and a little ammonia, or anything which tends to make the water soft; then rub dry with a towel, and after that go over the body from top to toe with a dry brush. Try this for two or three weeks, and your skin will be like velvet.

Tea and Coffee. Tea is a nerve stimulant, pure and simple, acting like alcohol in this respect, without any value that the latter may possess as a retarder of waste. It has a special influence upon those nerve centers that supply will power, exalting their sensibility beyond normal activity, and may even produce hysterical symptoms, if carried far enough. Its active principle, theine, is an exceedingly powerful drug, chiefly employed by nerve specialists as a pain destroyer, possessing the singular quality of working toward the surface. That is to

say, when a dose is administered hypodermically for sciatica, for example, the narcotic influence proceeds outward from the point of injection, instead of inward toward the centers, as does that of morphia, atropia, etc. Tea is totally devoid of nutritive value, and the habit of drinking it to excess, which so many American women indulge in, particularly in the country, is to be deplored as a cause of our American nervousness.

Coffee, on the contrary, is a nerve food. Like other concentrated foods of its class, it operates as a stimulant, also but, upon a different set of nerves from tea. Taken strong in the morning, it often produces dizziness and that peculiar visual sympton of overstimulus which is called *muscæ volitantes*—dancing flies. But this is an improper way to take it, and rightly used it is perhaps the most valuable liquid addition to the morning meal. Its active principle, caffeine, differs in all physiological respects from theine, while it is chemically very closely allied, and its limited consumption makes it impotent for harm.

The Shrinkage of Flannel. To keep flannels as much as possible from shrinking and felting, the following is to be recommended: Dssolve one ounce of potash in a bucket of water, and leave the fabric in it for twelve hours. Next warm the water, with the fabric in it, and wash without rubbing, also draw through repeatedly. Next immerse the flannel in another liquid containing one spoonful of wheat flour to one bucket of water, and wash in a similar manner.

Ancient Cities. Nineveh was 15 miles long, 8 wide and 40 miles round, with a wall 100 feet high, and thick enough for 3 chariots abreast. Babylon was 50 miles within the walls, which were 87 feet thick and 350 high, with 100 brazen gates. The Temple of Diana, at Ephesus, was 420 feet to the support of the roof. It was 100 years in building. The largest of the pyramids is 461 feet high, and 653 on the sides; its base covers 11 acres. The stones are about 30 feet in length, and the layers are 380. It employed 330,000 men in building. The labyrinth, in Egypt, contains 300 chambers and 250 halls. Thebes, in Egypt, presents ruins 27 miles round. Athens was 25 miles round, and contained 350,000 citizens and 400,000 slaves. The Temple of Delphos was so rich in donations that it was plundered of $500,000, and Nero carried away 200 statues. The walls of Rome were 13 miles round.

The Process of Embalming. The process of embalming is as follows, and is called the "Brunelli process": The circulatory system is cleansed by washing with cold water till it issues quite clear from the body. This may occupy from two to five hours. Alcohol is injected, so as to abstract as much water as possible. This occupies about a quarter of an hour. Ether is then injected to abstract the fatty matter. This occupies from two to ten hours. A strong solution of tannin is then injected. This occupies for imbibition from two to ten hours. The body is then dried in a current of warm air

passed over heated chloride of calcium. This may occupy two to five hours. The body is then perfectly preserved, and resists decay. The Italians exhibit specimens which are as hard as stone, retain the shape perfectly, and are equal to the best wax models. It will be observed in this process that those substances most prone to decay are removed, and the remaining portions are converted by the tannin into a substance resembling leather.

To Straighten Round Shoulders. A stooping figure and a halting gait, accompanied by the unavoidable weakness of lungs incidental to a narrow chest, may be entirely cured by a very simple and easily-performed exercise of raising one's self upon the toes leisurely in a perpendicular position several times daily. To take this exercise properly one must take a perfectly upright position, with the heels together and the toes at an angle of forty-five degrees. Then drop the arms lifelessly by the sides, animating and raising the chest to its full capacity muscularity, the chin well drawn in, and the crown of the head feeling as if attached to a string suspended from the ceiling above. Slowly rise upon the balls of both feet to the greatest possible height, thereby exercising all the muscles of the legs and body; come again into standing position without swaying the body backward out of the perfect line. Repeat this same exercise, first on one foot, then on the other. It is wonderful what a straightening-out power this exercise has upon round shoulders and crooked backs, and one will be surprised to note how soon the lungs begin to show the effect of such expansive development.

Care of the Eyes. In consequence of the increase of affections of the eye, a specialist has recently formulated the following rules to be observed in the care of the eyes for school work. A comfortable temperature, dry and warm feet, good ventilation; clothing at the neck and on other parts of the body loose; posture erect, and never read lying down or stooping. Little study before breakfast or directly after a heavy meal; none at all at twilight or late at night; use great caution about studying after recovery from fevers; have light abundant, but not dazzling, not allowing the sun to shine on desks or on objects in front of the scholars, and letting the light come from the left hand or left and rear; hold book at right angles to the line of sight or nearly so; give eyes frequent rest by looking up. The distance of the book from the eye should be about fifteen inches. The usual indication of strain is redness of the rim of the eyelid, betokening a congested state of the inner surface, which may be accompanied with some pain. When the eye tires easily rest is not the proper remedy, but the use of glasses of sufficient power to aid in accommodating the eye to vision.

How and When to Drink Water. According to Doctor Leuf, when water is taken into the full or partly full stomach, it does not mingle with the food, as we are taught, but passes along quickly be-

tween the food and lesser curvative toward the pylorus, through which it passes into the intestines. The secretion of mucus by the lining membrane is constant, and during the night a considerable amount accumulates in the stomach; some of its liquid portion is absorbed, and that which remains is thick and tenacious. If food is taken into the stomach when in this condition, it becomes coated with this mucus, and the secretion of the gastric juice and its action are delayed. These facts show the value of a goblet of water before breakfast. This washes out the tenacious mucus, and stimulates the gastric glands to secretion. In old and feeble persons water should not be taken cold, but it may be with great advantage taken warm or hot. This removal of the accumulated mucus from the stomach is probably one of the reasons why taking soup at the beginning of a meal has been found so beneficial.

What Causes Coughs. Cold and coughs are prevalent throughout the country, but throat affections are by far more common among business men. Every unfortunate one mutters something about the abominable weather and curses the piercing wind. Much of the trouble, however, is caused by overheated rooms, and a little more attention to proper ventilation would remove the cause of suffering. Doctor J. Ewing Mears, who is thus afflicted, said to an inquirer: "The huskiness and loss of power of articulation so common among us are largely due to the use of steam for heating. The steam cannot be properly regulated, and the temperature becomes too high. A person living in this atmosphere has all the cells of the lungs open, and when he passes into the open air he is unduly exposed. The affliction is quite common among the men who occupy offices in the new buildings which are fitted up with all modern improvements. The substitution of electric light for gas has wrought a change to which people have not yet adapted themselves. The heat arising from a number of gas jets will quickly raise the temperature of a room, and unconsciously people relied upon that means of heating to some extent. Very little warmth, however, is produced by the electric light, and when a man reads by an incandescent light he at times finds himself becoming chilly, and wonders why it is. Too hot during the day and too cold at night are conditions which should be avoided."

Facts not Generally Known.

Spinach is a Persian plant.
Horse-radish is a native of England.
Melons were found originally in Asia.
Filberts originally came from Greece.
Quinces originally came from Corinth.
The turnip originally came from Rome.
The peach originally came from Persia.
Sage is a native of the South of Europe.
Sweet marjoram is a native of Portugal.

The Newest Game

Takes the form of an information party, and is proving immensely popular. The game, as described by the *Boston Traveller*, is begun by passing to each gentleman a card and to the ladies small pieces of paper, which should be numbered. Those who discover the same number on their card and paper are partners for the game.

Each couple must think of a question, sensible or ridiculous, historical or in regard to the weather, to be written on the cards, after which the cards are to be gathered together, and the leader reads each in turn, giving a few moments for the partners to consider the subject and write the answer, which should be read aloud in turn. This is where the fun of the game begins, as many of the answers are exceedingly queer.

Those having a correct answer mark their card 10, a wrong answer 0 and if the answer is anywhere near right it is counted 5. When all are added, prizes may be distributed as in progressive games for the best and poorest record.

The instructive part of the game is the discussion which follows the questions. The height of Bunker Hill monument is what everybody living near it ought to know, and yet, at an information party held a few evenings ago, only one person in a company of twenty was sure of the exact number of feet.

"The Earth is the Lord's."

Lord of the lambkin and the lion,
Lord of Ben Lomond and Mount Zion,
Of Israel and Italy,
Watching in sweet tranquillity,
I worship Thee!

Lord of the glow-worm and the planet,
Lord of dim Patmos and grim Thanet,
Of Jordan's flood and Highland Dee,
Touched by their waves of harmony,
I worship Thee!

Lord of the sunrise and the sundown,
Lord of Jerusalem and London,
Of ruined Babylon, Rome the free,
Awed by sad tales of tragedy,
I worship Thee!

Lord of the well-spring and the geyser,
Lord of Jew Paul and Roman Cæsar,
Of England and deep Germany,
Dreaming of wondrous time to be,
I worship Thee!

Lord of the lark—heaven's happy roamer,—
Lord of King David and blind Homer,
Of Scotland and green Galilee,
Illumed by fires of memory,
I worship Thee!

Lord of the dewdrop and the ocean,
Lord of each heart's divine emotion,
Of heaven-born science, piercing free
To the sweet soul of mystery,
I worship Thee!

Teach me, dear God, and make me lowly,
Purge me with light, and make me holy;
Let me be crucified, and be
Christ-like, with Christ's humility,
Adoring Thee!

—Wm. Freeland.

ALPHABETICAL INDEX

Abolition movement, the 76
Abstracts of title.....130
Accidents and emergencies 208
Accidents on railroads, chances of.185
Acknowledgment, certificate of...143
Adams, John, administration of... 72
Adams, John Quincy, administration of..... 74
Administrators, duties of.....135
Advertisers, hints to.....181
Agency and attorney.....122
Agreement, general form of.....142
Agreements and contracts 115
Agricultural or mineral lands.....150
Air, dangers of foul.....189
Alcoholic poisoning.....211
Alexander the Great.....239
Alexandrian Library, the..... 5
Alloys, table of.....274
"Almighty Dollar," origin of..... 3
Amendments to the Constitution..156
America, discovery of..... 5
American party, the 79
Amsterdam 7
Annuity policies 178
Antidotes for poisons.....211, 227
Anti-Federalist party, the..... 72
Anti-Masonic party, the..... 76
Arts 234
Arts, to destroy.....221
Apoplexy.....194, 211
Apostles, fate of the.....215
Apothecaries' weight 230
Arbitration, the laws of.....133
Architects, handy facts for 267
Arch, largest..... 9
Arctic exploration..... 97
Area of principal countries..... 60
Areas of circles.....265
Army, proportions of..... 92
Aromatic, spirits of vinegar 216
Arrest, exemption from.....166
Arrests without warrant 166
Arson.....166
Arthur's administration 82
Artificial feeding of infants.....206
Assault and battery.....166
Assignment, form of.....142
Assignment of copyright 151
Assignment of patents.....154
Assignments 130
Asthma 202
Attorney, form of power of.....143
Australian ballot system, the 161
Authors and royalties.....107
Avoirdupois weights.....230
Balloon, first ascension 3
Bank controversy, the..... 76
Banker's time table.....184
Banking capital.....107
Bankruptcy.....173
Bankrupt, origin of term 283
Barbed wire for fences 235
Bar bell, the.....191
Bar iron, flat, weight of.....263
Barnabas, St. 225
"Barnburners," the..... 78
Barrels, how to measure.....232
Barrenness.....107
Bartholdi's statute of Liberty..... 10
Bartholomew, St.....225
Battles, number killed in..... 92
Battles of history, the decisive.... 92
Bay rum.....217
Bed bugs.....212
Bell-metal.....107
Bells, largest.....5, 107
Belting, horse power of.....269
Belting, table of 269
Bible, facts about the.....84, 113
Bibles of the world, the seven.....228
Bigamy.....166
Big trees.....183
Bile.....194
Bilious cholera 203
Bilious complaints 194, 208
Bill of exchange, form of.....142
Bill of sale, form of 142, 145
Bills of sale.....132
Birds, flight of.....107
Birds, life of..... 8
Birmingham wire gauges.....264
Birthdays.....282
Bladder, inflammation of the.....195
Bleeding from the nose.....209
Blindness.....113
Board and plank measurement table.....237
Boarding-houses, inns, etc., the law of.....131
Body in flames.....208
Boiler chimneys 274
Boilers, etc.....268
Boilers, size and capacity of.....273
Boiling, fusing and freezing points.....189
Bonds and guarranty 132
Bonds and stocks.....172
Bond, common form of.....142
Bond for a deed, form of.....143

Books, invention of..... 6
Book work measurement..... .285
Boots and shoes, to make water-proof 220
Boston fire.....106
Bovines v. Equines.....170
Bowels, inflammation of the.....195
Bowels, looseness of the 196
Brain, compression of the.....210
Brain, inflammation of the 195
Brain, measurement of the 112
Brain, water on the.....197
Brassware, to clean.....221
Breath, bad.....215
Brick chimneys.....273
Bricklayers and plasterers, facts for.....244
Bricks and pottery, color of.....233
Bricks, number in a building.....245
Brick required to construct any building 243
Bridges..... 10
Bridges, railroad 185
Brokerage and commission.....173
Bronchitis 202
Brooklyn theatre fire.....106
Brooms, to preserve.....221
Brown, John..... 79
Bruises and wounds.....202
Buchanan's administration 79
Buddhism.....297
Bug poison.....220
Building, highest..... 12
Building materials, wear and tear of.....256
Builders' estimating tables.....246
Builders, handy facts for.....243, 267
Buildings, height of 98
Buildings, public, capacity of.....111
Burglary.....166
Burns and scalds.....208
Burr's expedition..... 73
Bushel, legal weight of.....234
Business and legal forms 142
Business law in brief 114
Business letters..... 36
Cable, first Atlantic..... 5
Calhoun..... 75
Camel, facts about the.....108
Canary birds, the care of 229
Candle-power.....162
Capital employed in banking.....107
Capitals of principal countries.... 60
Capitals the use of..... 36
Capitol building, Washington..... 11
Carbon in food.....213
Car, capacity of freight.....188
Carpenters' work and measuring.253
Carpets, kerosene stains in 210
Carpets, to brighten.....210
Carrier-pigeons.....108
Casks, how to measure.....232
Cast iron and timber, strength of.246
Cast iron approximate weight of..262
Cast iron, assumed weight in estimating 261
Cast iron balls, weight of, etc.....261
Cast iron columns, weight of.....260
Cast iron, round, weight of.....261
Catacombs 8
Catarrh.....202
Cathedrals, height of..... 98
Cattle and horses, difference between.....170
Cattle, shipments of..... 8
Cattle, to tell age of.....226
Cattle, weight of.....232
Caveats 154
Cavern, largest 6
Cellar, to disinfect a.....219
Cement.....245
Cement and lime, weight of.....258
Cement, how to use.....247
Cement, tin box.....118
Census, U. S.....161
Centigrade thermometer.....188
Certificate of acknowledgment....143
Certificates, stock.....171
Chairs and desks for schools, sizes of.....257
Chance, the laws of.....176
Change, how to make.....182
Change, terms used on.....174
Charleston, great fire at.....174
Chattel mortgages..... 129
Checks paid in N. Y. and London.108
Cheops, pyramid of.....109
Chest weights.....191
Chicago fire..... ..106
Chicago, wonderful growth of.... 57
Chicken-pox.....194, 207
Chilblains..... 194, 202
Chimneys, boiler.....274
Chimneys, brick..... 273
Chinese wall..... 5
Choking.....207, 210
Cholera.....203
Cholera, Asiatic.....203
Cholera, English.....196
Cholera, bilious..... 203
Cholera, epidemics..... 113
Cholera mixture.....206
Christians, number of..... 9
Church, largest..... 11
Cipher marks, private..... 182
Circle, the area of a..... ..264
Circles, table of areas of.....265
Circles, table of circumference of.266
Circular arc, length of.....282
Circumference of earth—how measured..... 58
Circumference of circles..... 266

Cistern measure.....232
Cisterns, capacity of.....272
Cities, nicknames of..... 70
Cities of the U. S., table of..... 61
City, oldest in U. S..... 6
Civil service, the..... 163
Civil war of 1861-1865 85
Civil war, naval battles of the 89
Civil war, principal battles of the. 87
Claims, mining..... 149
Clay compromise, the..... 78
Clay, Henry..... 75
Cleveland's administration 82
Climates of the U. S.... 290
Coal, curious by-products from...156
Coal in the U. S.....103
Coal used as fuel..... 7
Cockroaches, to kill.....221
Colicils.....134
Coin, weight of..... 8
Cold in the head... 202
Cold, severest on record..... 97
Coke.....203
Collection of debts.....181
Cologne water..... 216
Colors, combinations of..... 274
Columns, cast iron, weight of.....260
Commission..... 173
Common fever..... 194
Compound interest..... 182
Compression of the brain.....210
Concussion..... 210
Confederacy, Southern, formation of..... 80
Conflagrations, great..... 106
Congress.....155
Constipation.....194, 203
Constitutional Union party, the .. 79
Constitutional law..... ..155
Constitution, amendments to the. 156
Constitutions (State), adoption of. 72
Constitution (U. S.), adoption of . 72
Consumption..... 194
Consumption, death from 111
Contagious diseases..... 207
Continental Congress..... 71
Contusions..... .309
Convulsions..... 194, 203
Contracts and agreements.. 115
Cooking, loss of meat in..... 213
Copernicus, system of..... 57
"Copperheads"..... 80
Copyright, the law of.....151
Cork, to remove a broken.... 220
Corliss engine, the.... 12
Corn, how to measure.....232, 235
Corns..... 216
Corporations..... 133
Cost and price marks..... 182
Cotton, first raised in U. S..... 5
Cotton spinning..... 3
Cough, common.....194, 203
Cough, whooping.....195, 207
Counterfeit money, how to detect.183
Cracks in plaster, to fill.....220
Cremation..... 108
Criminal law, points of.....166
Crittenden compromise, the..... 80
Cross ledges (mining laws) 150
Cross ties, per mile.....242
Croup..... ....194, 203
Crushing strength of stones, etc..259
Cubes and squares, tables of.....278
Custom-house, largest..... 13
Customs duties, list of.....306
Cuts and wounds.....209
Cylinder, to find capacity of a 271
Cylindrical cisterns or tanks, capacity of.....272
Daguerreotype process, invention of..... 6
Dandruff..... 216
Dark Ages..... 4
Davis, Jefferson..... 80
Deaf and dumb asylum, largest.... 7
Debts, how to collect.....181
Decimal approximations..... 262
Decimal equivalents of fractions..257
Deed, form of quit-claim.....143
Deed, form of warranty.....143
Deeds.....127
Democratic party, the..... 75
Democratic-Republican Party, the 72
Demonetization of silver 296
Depilatory, a safe.....215
Desert, the largest..... 7
Desks for schools, sizes of, etc....257
Diamonds, largest.....7, 108
Diarrhœa..... 203
Diet in homœopathy.....206
Digestion of various foods.....214
Dirt in the eye..... 208
Discounts, trade.....183
Diseases..... 194
Diseases, contagious.....207
Disinfectants..... 219
Dislocated thumb.....219
Distances from New York.....141
Dividends..... 171
Divorce, State laws governing 137
Dollar, the standard silver.....296
Domestic and drop measures..... 231
Doses for the horse.....227
Doses of medicine.....212
Doses in homœopathy.....205
Doses, safe, of poisonous drugs. ..213
Doses, table of proportion, etc....212
Dower, the right of.....137
Draft, form of..... 142
Draft at sight, form of.....146
Drafts.....114, 115, 118
Drain-pipe, capacity of..... 249

Dred Scott decision, the 79
Dropsy 195
Drowning 210
Drugs, poisonous 213
Drunkenness, apparent death from 211
Drunkenness not an excuse for crime 166
Ducks, geese and turkeys 223
Due bill, form of 146
Dumb-bell exercise 191
Durability of woods 275
Duties, customs 167
Dwarfs, famous 95
Dysentery 203
Dyspepsia 195, 204
Earth, circumference of, how measured 58
Earnings 221
Echo, the most remarkable 7
Eddas, the 228
Eggs, how to keep fresh 219
Eight-hour movement, the 102
Elections, State, when held 160
Electoral count act, the 159
Electoral College, the 158
Electrical terms 295
Electric eel 5
Electricity, storage of 294
Electricity, the wonders of 291
Electric light 3, 6, 292
Electric railway, the 292
Electric signal, first transmitted .. 7
Electric telegraph, first 4
Electricity, velocity of 6
Electro-magnetism 4
Elevation of continents 108
Emancipation, proclamation of ... 80
Embezzlement 166
Emergencies 208
Empire, largest 7
Enamel for shirt bosoms 221
Endowment policies 178
Engine, largest stationary 8
English cholera 196
Engravings, transferring 37
Envelopes, first use of 4
Epilepsy 195
Erasures in deeds 128
Errors in speaking 25
Eruptions on the face 195
Erysipelas 195, 207
Estimates of materials 245
Estimating tables, builders' 246
Ether, first used 4
Evaporation of water from fuel ... 108
Evictions in Ireland 95
Evolution, the theory of 297
Exchange, form of bill of 142
Executors, duties of 135
Exemption from arrest 166
Exemption from taxation 180
Exercise, physical 191
Expectation of life 178
Express, first 4
Eye, dirt in the 208
Eye, iron or steel spiculæ in the .. 209
Eye, lime in the 208
Eyes, inflamed 196
Factory fires 206
Fahrenheit's thermometer 188
Fainting, hysterics, etc 195, 210
Faintness 195
Families in U. S 179
Famines of history, the great 197
Farm, largest 9
Farms in U. S 179
Farms, law relating to, etc 225
Fasting 208
Federalist party, the 72
Federation of Labor 203
Felony 166
Fences, barbed wire for 235
Ferry-boat, largest 12
Fever, common 194
Fever, intermittent 196
Fever, typhus 197, 207
Fevers 204
Fields and lots, contents of 235
Fillmore's administration 78
Financial panics 196
Finding, the law of 140
Fire company, the first volunteer. 6
Fire insurance 177
Fire insurance, first office 3
Fire kindler, economical 219
Fires and conflagrations 196
Fishes, curious facts about 236
Fits 211
Five kings, the 228
Flag and lantern signals 136
Flag, the American 7
Flames, body in 208
Flatulency 204
Flax, production of 168
Flies, to destroy 212
Floating policies 177
Floods and inundations 106
Floor, wall and roof measure 245
Floors, weight of and load upon ... 257
Flowers, to keep fresh 221
Food, carbon in 213
Food, digestion of 214
Food, nutrition in various articles of 214
Food, properties of 214
Food, relative value of 213
Food for stock 233
Foreign money, value of 361
Forest fires 106
Fort Sumter, attack on 80
Foul air, dangers of 189
Franco-German war 108

Free list, the customs.....336
Free-Soil Democrats..... 78
Freezing mixtures without ice....190
Freight car, capacity of 188
Freight, comparative cost of by water and rail..... 13
Frost bite.....195
Frozen limbs..... 195
Fruits, degrees of sugar in.....213
Freezing, fusing and boiling points.....189
Fuel, water evaporation of.....108
Gallon, weight of a..... 271
Gases, suffocation from noxious..211
Gas, facts about.....251
Gas, first illumination with..... 5
Gas-pipe, to thaw out.....219
Garfield, Jas. A., twentieth president..... 82
Gauges and their equivalents.....263
Gauges, wire.....264
Geese, ducks and turkeys.....225
Gems of poetry.....300
Gems of knowledge..... 3
Generals commanding U. S. army. 83
General warranty deeds.....128
Geographical nicknames..... 69
German Empire re-established.... 4
Ghent, the city of.....233
Giants and dwarfs, famous..... 95
Gilt frames, to freshen.....220
Glass..... 252
Glass, first transparent..... 4
Glass, panes of, in a box.....253
Glass stopper, to loosen 220
Glassware, to toughen..... 220
Glazing and painting 252
Globe, to find solidity of.....264
Globe, to find surface of.....264
Goats, to tell age of.....226
Gold first discovered..... 3
Gold miners, table for.....240
Government of principal countries..... 60
Gout.....195
Grade per mile..... 236
Grain measure.....232
Grand jury..... ...156
Grand larceny..... 166
Grant's administration..... 81
Graphophone, the..... 292
Gravel.....195
Gravity, specific, table of.....276
Greenback party, the..... 81
Grenades, hand.....105
Guaranty, the law of.....132
Gymnastic exercises 191
Hand grenades..... 105
Handy facts for architects and builders..... 267
Handy facts to settle arguments... 3
Hanging. 210
Hair brushes, cleaning.....215
Hair, color of..... 107
Hair invigorator.....215
Hair, removing.....215
Hair, tricopherous for the.....215
Harrison, Benj. W., administration of..... 82
Harrison, W. H., ninth president. 77
Hartford convention, the..... 73
Harvard College..... 3
Hawks, flight of..... 3
Hayes' administration 81
Hay in mow, how to measure.....232
Headache.....204
Health, rules for preservation of.200
Heartburn..... 204
Heart, palpitation of the.....196
Heat, excessive, in the past..... 96
Heat, summer, in various countries..... 96
Hebrew race, the.....190
Heirship to property not bequeathed..... 135
Hemorrhage..... 209
Hiccough, cure for.....206
Hierarchy, the Roman Catholic...110
High water.....145
Hints to advertisers..... 181
Homestead law..... 164
Homœopathic remedies.....201
Homœopathy..... 201
Homœopathy, diet in..... 206
Homœopathy, doses in.....205
Homœopathy, when introduced... 4
Horizontal bar exercise.....191
Horse, endurance of the..... 86
Horse, medicines for the.....227
Horse, how to tell age of..... 226
Horse-power.....109
Horse-power, necessary to elevate water..... 271
Horse-power of belting..... 269
Horse-power of steam engines, etc.268
Horse railroad, first built..... 6
Horses and cattle, differences between.....170
Horseshoes, first made..... 4
Horse, what a, can draw.....229
Hotel, largest..... 13
Hotels, the law of.....131
How to detect counterfeit money .183
Human life, average..... 6
Hurricane, velocity of..... 6
Hydraulic information, useful....271
Hygiene..... 194
Hysterics.....195, 210
Ice, strength of.....109
Illegitimate births.....109
Illiteracy, statistics of.....101
Impeachment.....155

Import duties in various countries.101
Indian country, the..... 99
Indian, the American.....101
India rubber.....109
Indelible ink.....219
Indentures.....282
Independence, declaration of..... 71
Independence, war of..... 72
Indigestion.....195, 204
Indorsement of notes.....119
Infamous crimes in law.....166
Infants, artificial feeding of 206
Inflamed eyes.....196
Inflammation of the bowels.....195
Inflammation of the bladder.....195
Inflammation of the brain.....195
Inflammation of the kidneys.....195
Inflammation of the liver.....195
Inflammation of the lungs.....195
Inflammation of the stomach.....196
Inflammatory sore throat.....196
Influenza.....196
Ink, indelible.....219
Inks, printing.....274
Inland seas, area of, etc ... .141
Inns, hotels and boarding-houses, the law of.....131
Insanity, causes of.....113
Insects, to destroy.....222
Installment note.....146
Insurance.....177
Insurance company, largest 7
Interest accumulation.....182
Interest laws.....147
Interest rules.....183
Interesting facts of science, etc...107
Interlineations in deeds.....128
Intermittent fever.....196
Internal revenue.....180
Inter-State commerce law.....175
Inundations.....174
Ireland, evictions in..... 95
Iron—*See bar iron, cast iron and wrought iron.*
Iron and wood, weight of.....258
Iron ore, first discovered..... 6
Itch.....196
Jackson's administration..... 75
James, St.....225
Jaundice.....196
Jefferson, Thomas, administration of..... 73
Jesuits, order of, founded..... 4
Johnson's administration..... 81
John, St.....225
Johnstown flood.....106
Joint life policies.....178
Jude, St.....225
Kerosene first used for illuminating..... 5
Kidneys, inflammation of the.....195
Knights of Labor.....103
Knives, first used..... 6
Know-Nothings..... 79
Koran, the.....228
Labor congress, national.....103
Labor, Federation of.....103
Labor, organized, in the U. S....102
Lake Superior..... 11
Landlord and tenant.....123
Land measure.....233
Land measure (U. S.).....164
Land monopoly.....100
Lamp chimneys, to toughen.....220
Languages, name of God in 48 ... 13
Languages, number of..... 3
Lantern signals.....186
Larceny, grand and petty.....166
Lavender water..... 17
Law (business) in brief..... 14
Law, constitutional..... 55
Law, criminal..... 66
Law relating to farms, etc 25
Laws of chance..... 76
Lead, compression of..... 56
Leads and slugs..... 54
Leads for book work..... 56
Lead pipe, sizes and weights of... 48
Leads for newspapers..... 55
Lead, sheet, weight of..... 59
Leap years..... 8
Leases..... 93
Lease, short form of..... 94
Legacies..... 15
Legal advice..... 14
Legal forms..... 12
Legal tender..... 15
Leipsic fair, the..... 13
Leprosy..... 19
Letter combinations..... 165
Letter writing..... 35
Liberty, Bartholdi's statue of..... 10
Liberty party, the..... 77
Libraries, statistics of..... 9
Library, first American..... 6
Library, largest..... 6
Lien laws.....125
Life, average for professions.....107
Life, average of.....110
Life insurance, first..... 4
Lightning and sunstroke.....211
Light, velocity of..... 5
Limitation, statutes of.....147
Limited payment life policies 178
Lime, weight of.....258
Lincoln's administration..... 80
Lincoln, assassination of..... 4
Lisbon earthquake..... ...290
Liver complaint.....194
Liver, inflammation of the.....195
Load upon floors.....257
Locomotive, cost of a.....185

Locomotive, largest..... 10
Locomotive whistle signals.....187
Logs reduced to inch board measure.....239
Loisette's system of memory..... 14
London fire.....106
Loneness of the bowels.....196
Lots and fields, contents of.....235
Louisiana purchase..... 73
Luke, St.....225
Lumber, etc., weight of.....255
Lumber, to find quantity of, in a log.....236
Luminous paint..... 37
Lungs, inflammation of the.....195
Madison's administration..... 73
Mails, money lost in.....155
Majority, age when attained.....158
Manhattan, origin of name.....247
Mankind, races of..... 59
Mansion, costliest..... 11
Man, tallest..... 8
Marble slabs, weight of.....258
Marine insurance.....179
Mark, St.....225
Marriage and divorce.....137
Married women, rights of.....139
Masonry, weight of.....258
Mason work.....245
Match, first lucifer..... 5
Matthew, St.....225
Matthias, St.....225
Mayhem.....166
Measles..... 196, 204, 207
Measurement, type, by square inches.....286
Measures of capacity.....233
Measures, the meaning of 231
Meat, loss of, in cooking.....213
Medicine and hygiene 194
Medicine, doses of.....212
Medicines for the horse.....227
Meerschaum..... 5
Memory, Loisette's system of..... 14
Menstruation.....196
Metals, combinations of..... 274
Metric tables, handy.....231
Metric weights and measures.....230
Mexico, war with.....5, 77
Militia, State.....156
Mind cure, the.....308
Mineral lands (mining laws).....150
Mines, largest and deepest..... 10
Mining laws..... 149
Mirrors, glass, first made..... 5
Misquotations..... 314
Mississippi river..... 12
Missouri compromise..... 74
Mixing inks and paints..... 274
Mold, to prevent.....219
Monarchs and their end..... 170
Money, Roman, in New Testament.103
Money, time in which it doubles ..182
Money, value of foreign..... 229
Monkey wrench, the..... 9
Monopoly, land.....100
Monroe doctrine, the..... 74
Monroe, James, administration of. 74
Mouth wash..... 215
Monuments, height of..... 98
Monument, highest..... 8
Mormons, arrival of..... 6
Mortgage, form of.....143
Mortgages..... 129
Mosquitoes, to keep out..... 211
Moths, to get rid of..... 212
Mottoes of the States..... 68
Mountain, highest..... 12
Mountains, highest range..... 3
Mrs. Partington, the original.....231
Mucilage..... 217
Mumps..... .196, 205
Murder, degrees of.....166
Musical notes first used..... 5
Mustache grower..... 216
Mysticism..... 307
Nails and spikes..... 241
Nails required for different kinds of work..... 242
Names of the States..... 67
Napoleon I..... 3
Native American party..... 77
Natural bridge, highest..... 6
Naturalization..... 157
Natural sines, etc.....283
Nature's wonders, some of.....113
Navy in the civil war, the..... 90
Nebular hypothesis..... 58
Needles first used..... 6
Negotiable paper.....104, 105, 118
Nervousness..... 196
Nettlerash..... 205
Newspaper measure, standard....284
Newspapers..... 8
Newspapers in U. S..... 9
Newspapers, numbers of.....103
Newspapers, sizes of.....286
Newspaper type measurement....285
New York fire..... 106
Niagara Falls.....8, 239
Niagara, horse-power of.....109
Nicknames of cities..... 70
Nicknames of States..... 69
Nicotine, proportion in tobacco...109
Nijni-Novgorod, the fair of.....108
Non-forfeiting policies..... ..178
Nose, bleeding from the.....209
Note, joint promissory.....145
Note not negotiable.....145
Note payable at bank.....145
Note payable by installments.....146
Note payable on demand.....145

Note with surety.....145
Note, promissory, form of.....145
Notes and negotiable paper.....114, 115, 118
Nullification ordinance..... 75
Obelisks, Egyptian.....292
Ocean, depth of the.....154
Ocean passage, quickest..... 8
Oceans, dimensions of.....141
Odor, to remove the, from a vial..210
Open policies.....179
Opium.....111, 221
Order, 250 points of.....104
Oregon, reoccupation of..... 77
Organized labor in the U. S.....102
Overflows, great.....106
Ox, largest..... 11
Painting and glazing.....252
Paint, luminous..... 37
Paint, to remove from window glass.....220
Paints, mixing.....274
Palpitation of the heart.....196
Panics, great financial..... 96
Paper, invention of..... 3
Paper money, circulation of..... 7
Paper, book and print, sizes of....298
Papers, flat, common sizes of.....296
Paris..... 8
Park, largest in U. S. 6
Park, the most extensive..... 6
Parliamentary law.....104
Partington, the original Mrs.....231
Partnership, the law of 120
Paste, a brilliant.....217
Paste, acid-proof.....218
Paste, a perpetual,.....217
Paste, a strong.....217
Paste, a sugar.....217
Paste for papering boxes.....216
Paste for printing-office.....218
Paste for scrap-books.....217
Paste, paper and leather.....217
Paste to fasten cloth on wood.....218
Patents, how to obtain.....252
Paul, St.....252
Pens, first steel..... 5
Perjury.....166
Personal liberty laws 78
Philip, St... 225
Phonograph, invention of..... 3
Phonograph, the 291
Photographs first produced..... 4
Physical exercise 191
Pianoforte, invention of..... 6
Piano polish.....295
Pierce's administration..... 78
Piles.....196, 205
Pipe, block tin.....249
Pipe, diameter and capacity of....271
Pipe, lead, sizes of, etc.....248
Pitch, lake of 235
Plague, London..... 3
Plagues, remarkable..... 97
Planetary system, elements of the 57
Plank measurement table..... 37
Plants to an acre..... 33
Plasterers, facts for..... 44
Plastering, putty for..... 44
Plate glass.... 52
Plato's definition of man..... 172
Plumber's etc., useful tables for.. 48
Poetry, gems of..... 00
Poison for bugs..... 22
Poisons and their antidotes...211, 27
Polish for shirt bosoms..... 11
Political history (U. S.)..... 71
Polk's administration..... 77
"Poor Man's Region"..... 24
Popes 10
Popular vote for presidents..... 61
Population of American cities 61
Population of principal countries. 38
Population of States..... 61
Population of U. S..... 61
Population of U. S., increase of... 61
Postage Stamps, first used..... 3
Postal information..... 95
Post-office, first established..... 5
Pottery 4
Poultry, 300 facts about..... 23
Power of attorney, form of 13
Power, table of transmission of, by wire ropes 20
Practical calculations..... 32
Preferred stock..... 11
Prescriptions 17
Preserving wood..... 25
Presidency, legal qualifications for the.....156, 159
Presidential election, the. 138
Presidential election statistics....161
Presidential succession 159
Presidents of the U. S. (table).... 83
Pressure of the atmosphere 271
Pressure of water..... 271
Price and cost marks..... 182
Prickly heat, cure for..... 215
Printers, useful information for..284
Printing, chronology of..... 3
Printing inks, mixing of.....274
Printing-office, paste.....218
Promissory note, form of.....145
Pronunciation, rules of.....30, 31
Public debt, principal of the..... 98
Public lands, titles to, how acquired.....164
Public schools, first..... 4
Publishers, useful information for.....284
Pulleys for physical exercise.....193
Pump cylinders.....271

Pumps, efficient working of.....271
Pumps, double-acting.....272
Punctuation..... 35
Pigents, volatile salts for.....216
Putty for plastering 244
Pyramid of Cheops 109
Pyramid of Ghizeh..... 11
Quinsy.....196
Quit claim deed, form of.....143
Rabbits 209
Races of mankind..... 59
Railroad construction table.....342
Railroading, twenty points on American.....185
Railroads and transportation 185
Railroad signals.....186
Railroads, speed on.....187
Railways, miles of in U. S.....185
Railway to the sun..... 83
Rails required per mile (table)...242
Rails, steel, duration of.....185
Ramphorhyncus, the.....247
Rank of States—*See maps.*
Rats, destruction of.....221
Rats, how to get rid of.....105
Razor-strop paste.....216
Reaumur thermometer.....188
Recipes, etc.....215
Reconstruction (Southern).....77, 81
Redwood trees of California 183
Religion in America..... 99
Religious denominations.....110
Republican party, the..... 72
Reserve (insurance).....178
Returning board system, the..... 81
Rheumatism..... 196
Rickets.....197
Rifle ball, velocity of..... 4
Right of dower, the.....137
Rights of married women.....139
Ringworm 197
Rivers, flow of..... 5
Rivers, longest..... 12
Road, the rule of the.....295
Roman Catholic hierarchy.....110
Roman money.....103
Rome founded..... 3
Roofers, hints for.....250
Roof, wall and floor measure.....245
Rose water.....216
Rotheln.....207
Royalties paid authors.....207
Rubber, India.....109
Rubble.....245
Sacred College, the.....110
Safe doses of poisonous drugs 213
Salaries, big.....245
Salts, volatile.....216
San Francisco, great fire at..... 106
San Marino.....258
Santiago, great fire at.....106
Savings accumulations.....182
Scalds and burns.....208
Scantling and timber measure....238
Scarlet fever.....197, 207
School, largest..... 12
Scrofula 197
Scurvy.....197
Seas, inland, largest..... 3
Seattle, great fire at.....106
Secession, first proposer of.....224
Seeds, quantity required for planting..... 234
Serfdom in Austria..... 94
Serfdom in Russia..... 94
Serfs, German 95
Settlement, first in America 9
Seven sages..... 8
Seven wise men, sayings of the.. .240
Seven wonders of the world 9
Sewing machine, first patented... 5
Shampoo, liquid.....215
Shaving compound..... 216
Sheep and goats, to tell age of....226
Shingles, number required in a roof..... 250
Ship, largest..... 9
Shirt bosoms, enamel for.....221
Shocks, violent..... 210
Shoes, to make waterproof.....220
Short interest rules.....183
Short rates, insurance.....177
Sickness, ratio of..... 110
Signal Service, U. S..... 289
Silver, a wash for cleaning.....220
Silver dollar, the standard.....296
Simon Zealot, St.....225
Sines, tangents, etc..... .283
Sinks and drains, to disinfect.....219
Skull, measurement of the.....112
Skylights.....252
Slates, number of, per square ... 250
Slavery and serfdom..... 93
Slavery, first established..... 5
Slavery in the U. S..... 94
Sleeping-cars, cost of..... 185
Sleeping-cars, first in use... 185
Smallpox.....197, 207
Smallpox epidemics..... 107
Smelling salts, inexhaustible.....216
Smoke stains, to remove.....218
Soap, first manufactured..... 4
Solar system, the..... 57
Sore throat, inflammatory.....196
Sound, velocity of..... 3
Sparrow, the English..... 70
Specific gravity of various substances.....276
Spectacles, invention of 4
Speed on railroads..... 187
Spelling, short rules for..... 35
Spherical shells, to find weight of.261

Spikes and nails.....241
Spikes, railroad.....242
Spirits, when "proof".....112
Sprains.....205
Shrubs, plants or trees to an acre.233
Squatter sovereignty..... 79
Squares and cubes, tables of.....278
Stage favorites..... 165
Stains, to remove..... 218
Stains, to remove, from furniture.220
Standard time.....296
Starch, percentage of, in food 213
State elections, when held.....160
States, mottoes of..... 68
States, names of..... 67
States, nicknames of..... 69
Statutes of limitations.....147
Steamboating.....187
Steam engine, first..... 6
Steam engines.....268
Steamer, first to cross Atlantic.... 4
Steam piston, to find area of.....271
Steel rails, duration of 185
Steel, tensile test of..... 276
Stephens, Alexander H..... 80
Sterility.....107
St. John, great fire at.....106
Stock investments explained.....171
Stomach-ache.....203
Stomach, inflammation of the. 196
Stock, food for.....233
Stolen property.....166
Stones, weight of.....258
Storm clouds, velocity of..... 4
Storm, velocity of..... 5
Stovepipe, to clean..... 220
Strength, comparative scale of ...110
Strike, first in U. S.....102
St. Vitus' dance.....197
Suffocation..... ...211
Sugar-cane, first cultivated. 5
Sugar, degrees of, in fruits.....213
Summer heat in various countries 96
Sunday-school, first established... 6
Sun jumps a day, place where.....176
Sunstroke.....211
Suspension bridge, largest..... 7
Synonyms and atonyms..... 38
Tacks.....241
Tangets, etc..... ... .283
Tanks, capacity of.....272
Tariff—*See import duties.*
Tariff, the U. S. customs 167, 306
Taxes..... 180
Taylor's administration..... 78
Teething.....205
Teeth, removing tartar from the..215
Telegraph, first in operation..... 5
Telephone, the..... 291
Telescope, invention of the..... 4
Temple, largest..... 11
Tensile and transverse strength..276
Tensile strength of stones, etc....259
Tensile test of steel.....276
Term life policies..... 178
Terms used on 'Change.....174
Texas.....12
Texas, annexation of..... 177
Theater, first in U. S. 5
Theosophy.....13
Thermometer, facts about the....183
Thermometer, how to test a 219
Thermometric scales, comparison of.....188
Thomas, St..... 225
Throat, inflammatory sore... ...196
Thrush..... 197
Thumb, dislocated.....209
Ticdouloureux.....197
Ties, cross, per mile (table) 42
Tilden, Samuel J.....181
Timber and cast iron, strength of.246
Timber measure (table). 238
Timber rules..... ... .236
Timber, to tell soundness of.....236
Time difference between New York and foreign cities.....190
Time measure..... 160
Time, standard..... 296
Time table, bankers'.....184
Tin box cement.....217
Tin, roofing..... 251
Tints, preparation of 174
Title, abstracts of 128
Titles in Great Britain..... 7
Titles of nobility.....155
Tobacco, discovery of 7
Tobacco, proportion of nicotine in.199
Toothache..... 197
Toothache cure.....225
Toothache tincture..... .225
Tooth paste..... 225
Tooth powder..... 225
Tories..... 12
Torpedo signals..... 186
Trade discounts..... 183
Trade dollar.....293
Trademarks, the law of.....152
Trade secrets, etc.....215
Trades-unions..... 102
Train management 185
Transferring engravings..... 37
Transferring of property.....137
Transit insurance 179
Transverse strength.....276
Treason..... 155
Trees, how to measure.....232
Trees of California, large 183
Trees or plants to an acre.... 233
Tree, the largest..... 7
Tricopherous for the hair.....215
Trillion, a, what it is..... 180

Trip around the world.....148
Troops engaged in civil war..... 85
Troy weights.....230
Trust deeds.....128
Try Pitikes, the.....228
Tuns, capacity of.....109
Tunnel, longest..... 7
Tunnel, longest railway 185
Tunnels (mining law).....150
Turkeys, ducks and geese.....225
Turpentine, the virtues of.....217
Tyler's administration..... 77
Type, body, how to estimate for ..284
Type measurement by square inches..... 286
Type, etc., weight of.....284
Typhus fever.....297, 307
United States political history.... 71
United States, population of..... 61
University, the largest..... 5
Upas tree.....256
Useful hydraulic information 271
Vaccination and smallpox.....107
Valley of death, the..... 7, 256
Valley of the Upas Tree.....256
Van Buren's administration 76
Vegetables, how to measure 232
Vermin, to destroy.....221
Veto, presidential.....155
Violent shocks.....210
Volatile salts for pungents.....216
Volcano, loftiest, active..... 7
Volcano, the largest..... 7
Voting and naturalization..... ..157
Voting, qualifications for in all the States.....160
Watches, first constructed..... 3
Watches, first made..... 6
Water for domestic use.....272
"Watering" stock.....271
Water on the brain.....197
Water-pipe, to thaw out.....219
Waterproof cloth, how to make...295
Waterproof, to make boots or shoes.....220
Water, to tell pure.....105
Wall, roof and floor measure.....245
Wandering Jew, the 240
War, losses from..... 91
Warranty deed, form of.....143
Wars, American, length and cost of 91
Wars, cost of recent..... 91
Wars of the U. S..... 84
Washington, George, administration of..... 72
Washington monument..... 12
Wear and tear of building materials.....256
Weather signals.....289
Wedding anniversaries 282
Weight in cubic feet of various substances 276
Weight of type, etc.....284
Weight of floors, etc.....257
Weights and measures.....230
Weights and measures, handy....231
Weights, miscellaneous.....258
What's in a name? 34
When a man becomes of age.....158
Whigs..... 72
Whisky ring trials 81
Whites.....197
Whooping cough.....195, 205, 207
Will, form of.....144
Wills.....133
Wilmot proviso, the..... 78
Wind and weather signals.....289
Window glass.....252
Windows, glass, first used..... 4
Wire gauges.....264
Wire, longest span of..... 8
Wire ropes, table of transmission of power by.....270
Wonders of electricity.....291
Wonders of nature.....113
Wood, bulk, how to measure.....232
Wood engraving..... 6
Wood, how to preserve.....295
Woods, durability of.....275
Wood, weight of.....258
Words often mispronounced..... 32
Working life, man's.....107
Workingmen's party.....102
World's principal countries..... 60
Worms in the intestines.....197, 205
Wounds and bruises.....202
Wounds and cuts.....209
Wrought iron, approximate weight of 262
Wrought iron, assumed weight of.263
Zendavesta, the.....228

A Business Opportunity . . .

A GLANCE at this little book will convince the most skeptical of the truth of our claim that never before in the history of book-making was so much valuable information condensed in a single volume. That is the reason why it sells at sight. In fact, **its sales are phenomenal.** Agents send in reports which would be considered wonderful for any other book, and they find the work pleasant and profitable because the book **requires no talking. It speaks for itself.** No intelligent man can even hastily turn its pages without finding at least a few things which are each worth more to him than the price of the book.

You can make money with an agency for this book. Write us for confidential terms. We do not restrict agents to territory, and there is no red tape about it. All we ask is that you show the book wherever and whenever you wish. You need not bore people to get an order. Nine practical men out of ten will appreciate the merits of the work at sight, buy a copy and thank you for giving them the opportunity. **Our terms are liberal,** and any active person can clear from $3.00 to $20.00 per day. Address

THE PUBLISHERS.

A VALUABLE SCIENTIFIC WORK

SEX AND LIFE

The Physiology and Hygiene of the Sexual Organization

BY

ELI F. BROWN, M.S., M.D.

Illustrated. 16mo. Cloth extra, $1.00

"'Sex and Life,' by Dr. Eli F. Brown, is a very sensible book, for it discusses plainly yet with delicacy, the physiology and hygiene of the sexual organization. After describing the common sex principle in plants and animals, the author enters upon the discussion of conjugal love, heredity, the use and abuse of the sexual passion, and other topics which seldom find a place in a volume for general reading. His work cannot fail to have good results, for his suggestions are wise, and the information that he furnishes should be known to all."—*San Francisco Chronicle.*

"A modest, compact, scientific exposition of the machinery and its operation through which human life is passed from generation to generation, based upon the theory that there is no subject of greater importance. The innocence that is innocent simply because of ignorance is the unsafest thing in the world, unless it be the virtue that is virtuous only because it has never been tempted, or the honesty that is honest from policy only."—*Chicago Times.*

"How to teach such truths has been the study of many a parent and many a teacher. There is but the one proper way, and that is by plain facts, which, while teaching the truths of science, impress upon the pupil the grandeur of right living. Dr. Brown, in his pages, strikes these chords admirably."—*Inter Ocean.*

SENT BY MAIL TO ANY ADDRESS ON RECEIPT OF PRICE

SCHULTE PUBLISHING COMPANY
334 DEARBORN STREET
CHICAGO

LIBRARY OF CONGRESS
0 029 547 995 4